JULY 23, 1960
VOL. 159 — NO. 4

Telephony®

THE JOURNAL OF THE TELEPHONE INDUSTRY

Published every week on Saturday by TELEPHONY PUBLISHING CORP. 608 S. Dearborn St., Chicago 5, Ill. Subscription $6.00 per year. Entered as second class matter at the Post Office at Chicago, Ill., under the act of Mar. 3, 1879.

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It took 200 telephone specialists to install GOP convention communication facilities. Here technicians are installing two of the 40 microwave "dishes" which beam convention to coast-to-coast audience. See page 46.

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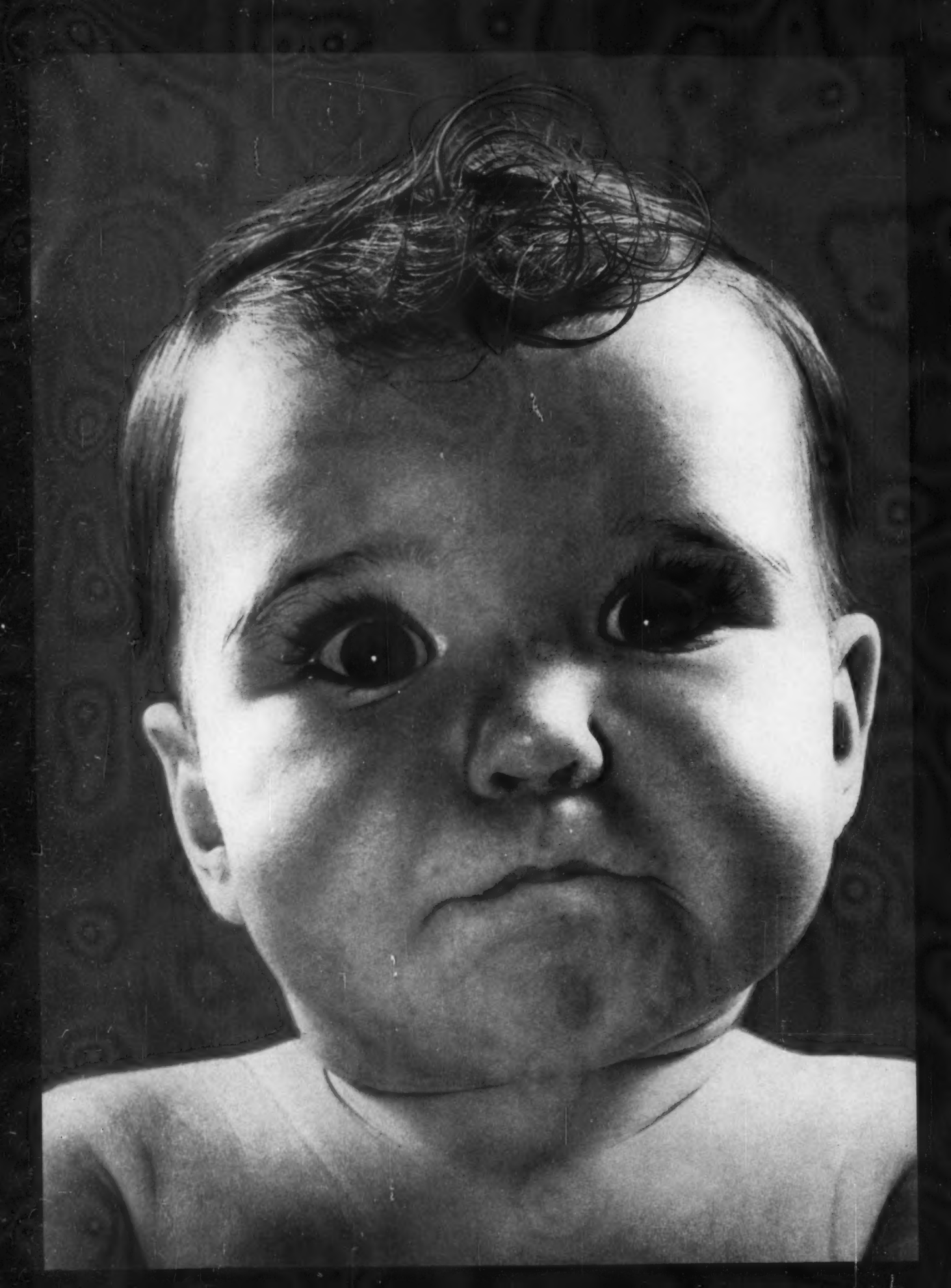

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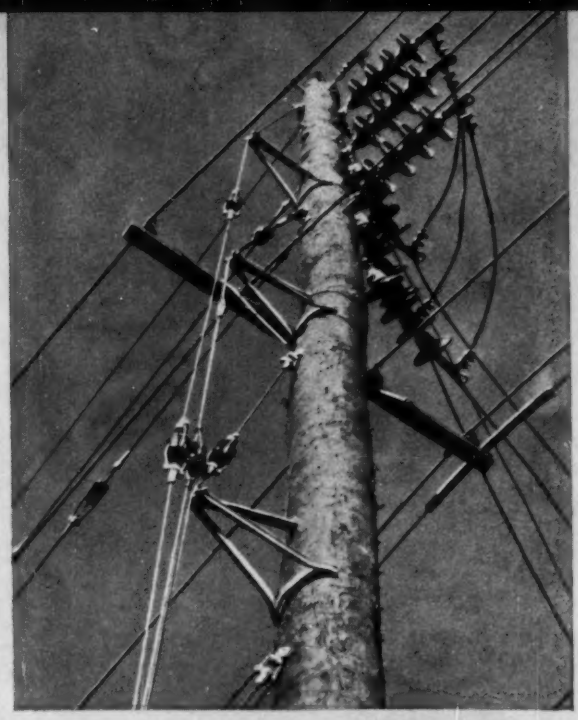

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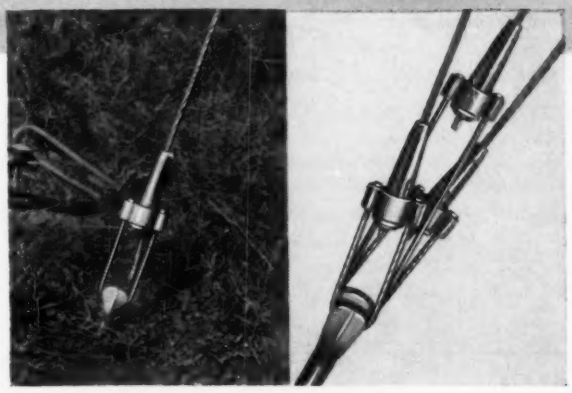

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FLASHES AND PLUGS

GONE BUT NOT FORGOTTEN. This poignant dog story appeared in AT&T's *Long Lines* magazine. Joseph G. Lindsay, the magazine's editor, has such a facility for spinning a yarn that we are leaving it in his words:

Buck is a dog. It would be difficult to say what particular breed because in polite circles his ancestry is referred to as "mixed." However, his lowly descent in no way affects the affectionate regard in which he is held by his owner, a lady who lives in Freeport, Long Island.

Buck is a bright-eyed and intelligent animal and until recently was as happy a dog as could be found in any New York suburb. The change came about when the owner's son took Buck home with him to Perrysburg, O., on a visit.

Buck couldn't adjust himself to his new surroundings. He was a stranger in a strange land and he suffered from one of the most poignant of all diseases—homesickness.

Eight days after Buck's arrival in Ohio, his owner on Long Island called up her son in far away Perrysburg. Buck was allowed to listen in.

As the receiver was held to his ear, he gave yelp after yelp of joyous recognition. He had heard once again a beloved and well-remembered voice.

Buck fled the house. He was seen no more in Perrysburg. He was heading home.

It was assumed that he was somewhere on the Pennsylvania Turnpike. Buck was a veteran turnpike traveler, although not on four feet. He liked to sit on the front seat of the car with the wind whistling through his ears.

His distressed owner got into her car and searched the highway. She had with her a small, portable public address system through which she called from time to time along the road: "Buck, where are you?" She never found him.

So if by any chance you do run across a loyal, footsore little dog headed for Freeport, Long Island, give him a lift. It might be Buck.

•

SALAD COURSE. Someone at a drive-in restaurant called Albuquerque, N. M. police to complain that a man was outside "eating the evergreens."

A 41-year-old man standing in front of the place with a mouth full of pine needles was arrested for drunkenness.

•

BEYOND HIS MEANS. Elmer Wood, writing in Illinois Bell Telephone Co.'s subscriber insert *Telebriefs* tells of a friend who while on an out-of-town trip put through a collect call to his home. His young son answered the call.

"Will you accept the charges?" asked the operator.

There was an utter silence, then a gasp and a wail.

"But, Daddy, you know I can't pay for this," the youngster moaned. "I only get 15-cents a week!"

CHANGE OF ADDRESS

Please notify your local postmaster and the Circulation Department of TELEPHONY of change of address. Change cannot be made without the old as well as the new address. Allow three weeks for change of address to become effective.

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY
Since 1901

July 23, 1960

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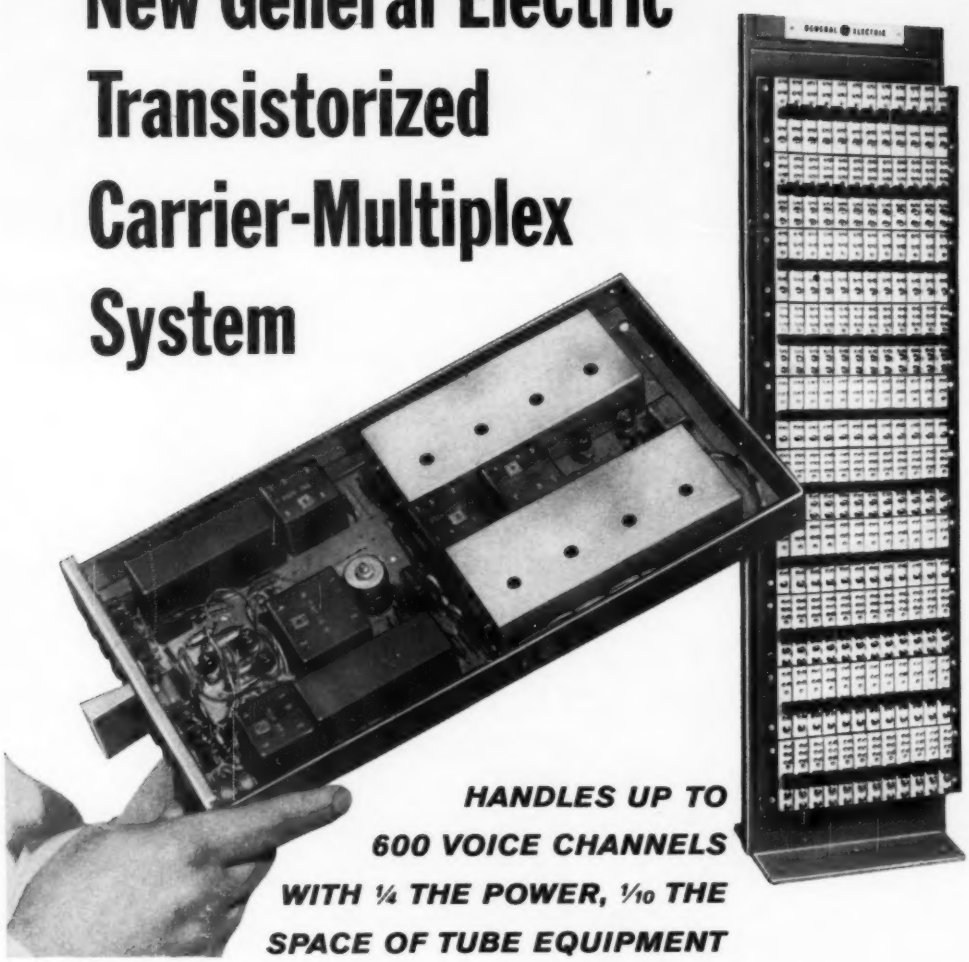
Published every week on Saturday by TELEPHONY PUBLISHING CORP., 608 S. Dearborn St., Chicago 5, Ill. Entered as second class matter at the Post Office at Chicago, Ill., under the act of Mar. 3, 1879. 30c per copy (except special issues—50c). Subscription $4.50, 1-year; $7.00, 2-years; $9.00, 3-years. Add $1.00 per year for postage to Canada and Pan American countries; $2.00 per year to Foreign countries. Telephone WAbash 2-2435.

New General Electric Transistorized Carrier-Multiplex System



HANDLES UP TO 600 VOICE CHANNELS WITH ¼ THE POWER, 1/10 THE SPACE OF TUBE EQUIPMENT

General Electric's new TCS-600 is the world's first fully transistorized carrier-multiplex system capable of handling from one to 600 voice channels on either metallic circuits or a single radio circuit. A single sideband suppressed carrier system, the TCS-600 meets or exceeds all domestic and CCITT standards.

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You'll be surprised by the low first cost and high yearly savings made possible by the TCS-600. For full details, write General Electric Company, Communication Products Dept., Section 35760-23, Mountain View Road, Lynchburg, Va.

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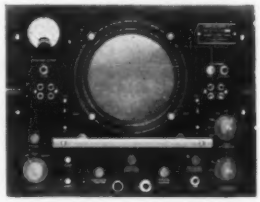
We are proud to announce the appointment of International Teletronics Inc. as exclusive distributor for Hallamore to the Independent Telephone Industry. We consider this an important step ahead in our efforts to serve you with better transmission equipment, testing systems, and services. Hallamore Electronics Division of the Siegler Corp. 714 N. Brookhurst Ave., Anaheim, California. Phone PR 4-1010 DDD AREA 714



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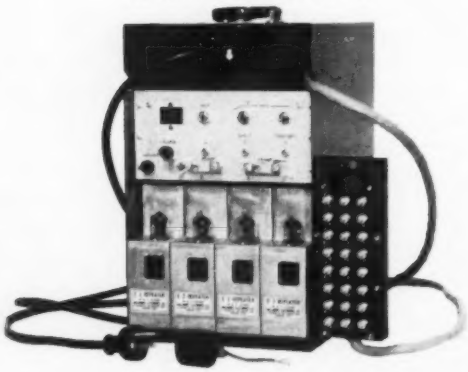

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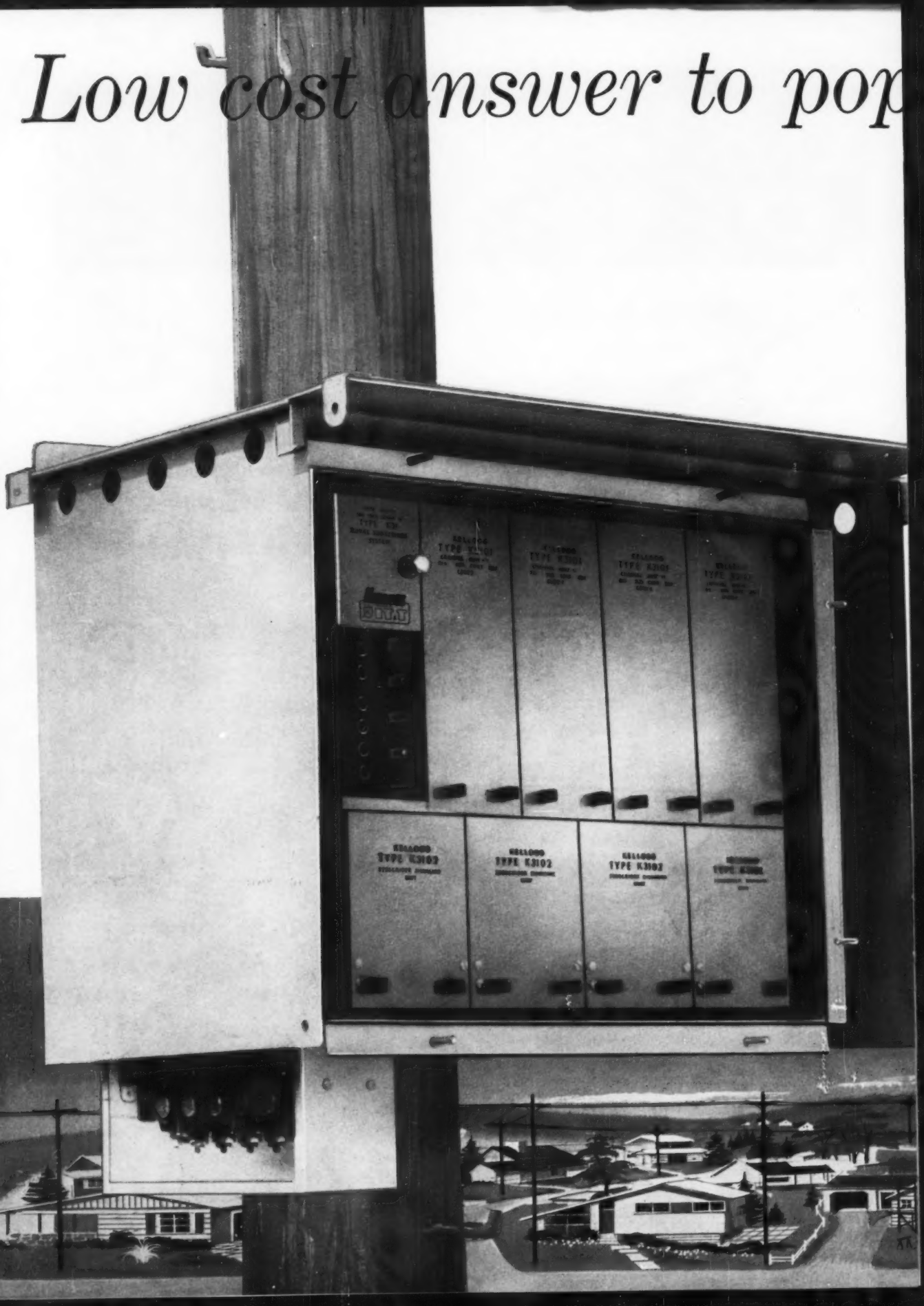

ulation growth needs...

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No industry knows better than America's independent telephone companies the strains that an explosive population growth can cause. Service demands tax existing facilities to the utmost and put many operating companies in a tight financial squeeze.

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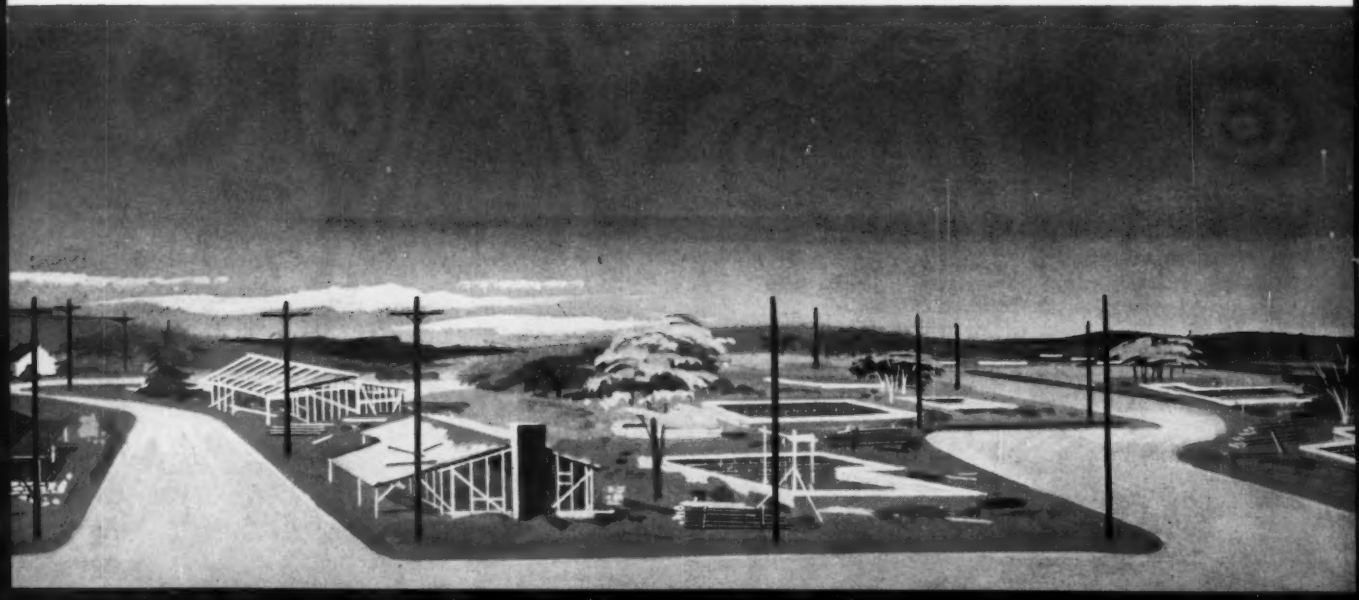

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More than 13 years ago Bartlett successfully pioneered the use of the helicopter for shade tree spraying—an operation that was to lead the way, a few years later, to a new efficient method of control of woody plants along utility rights-of-way.

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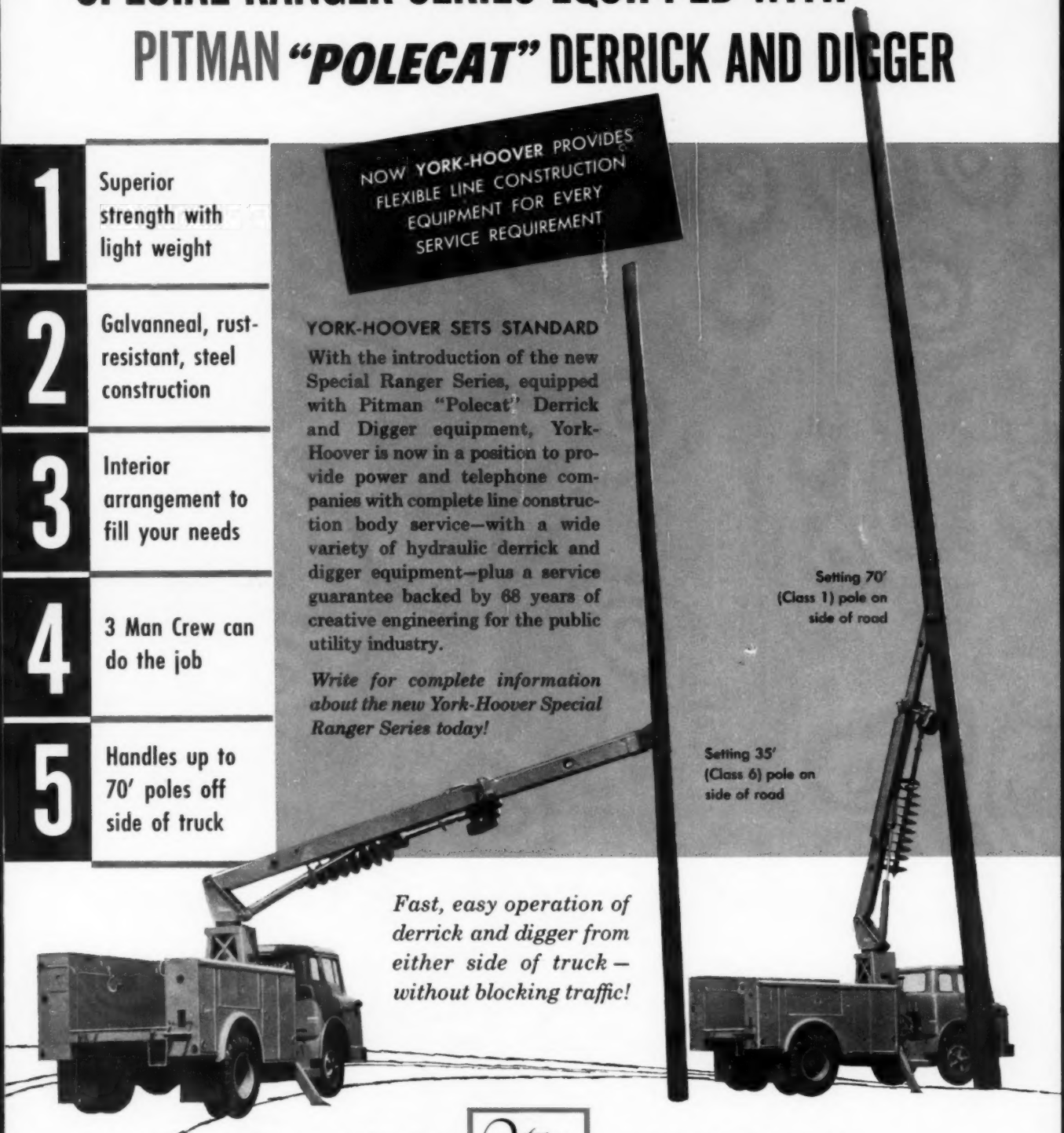

Fast, easy operation of derrick and digger from either side of truck — without blocking traffic!

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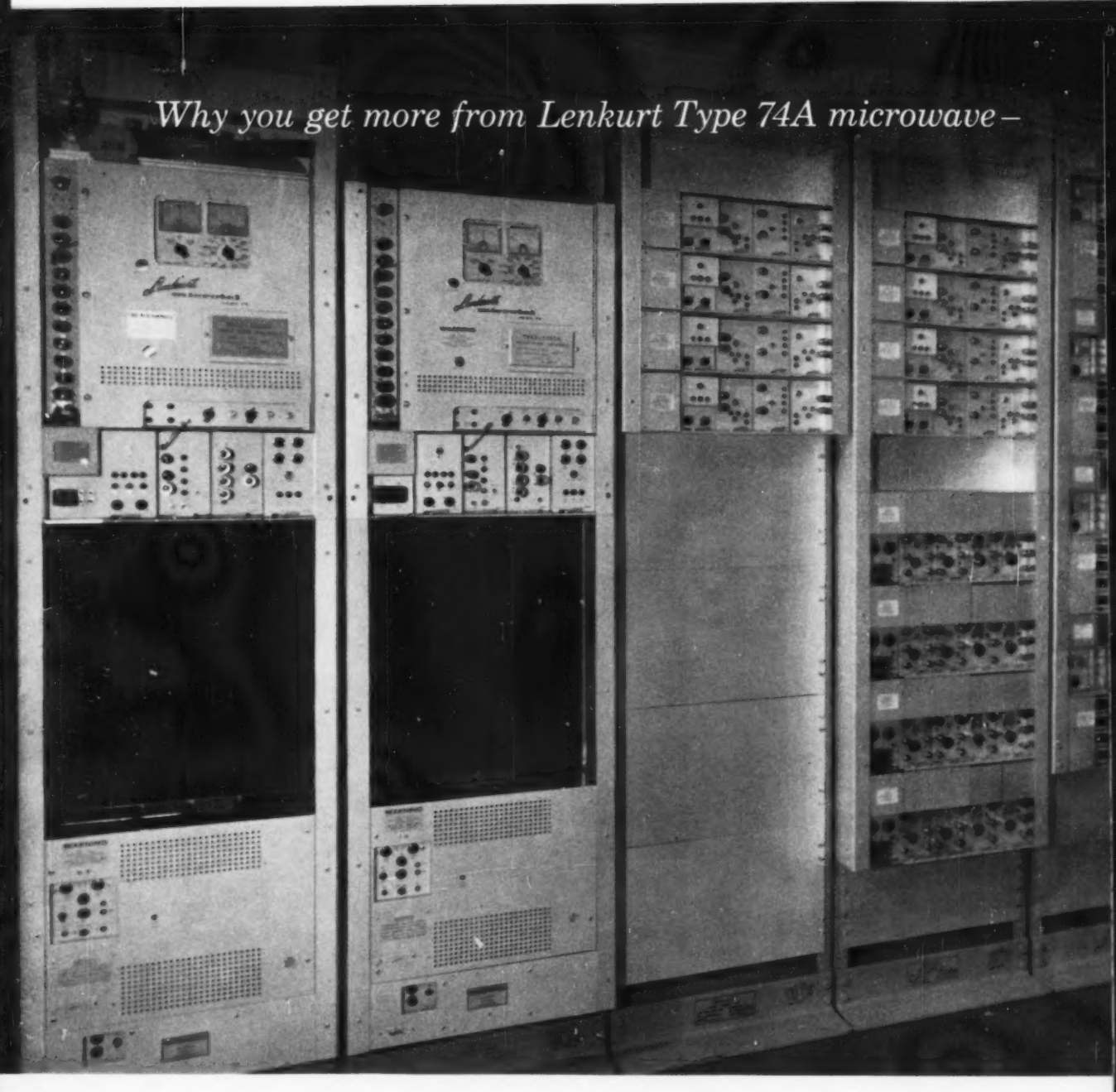
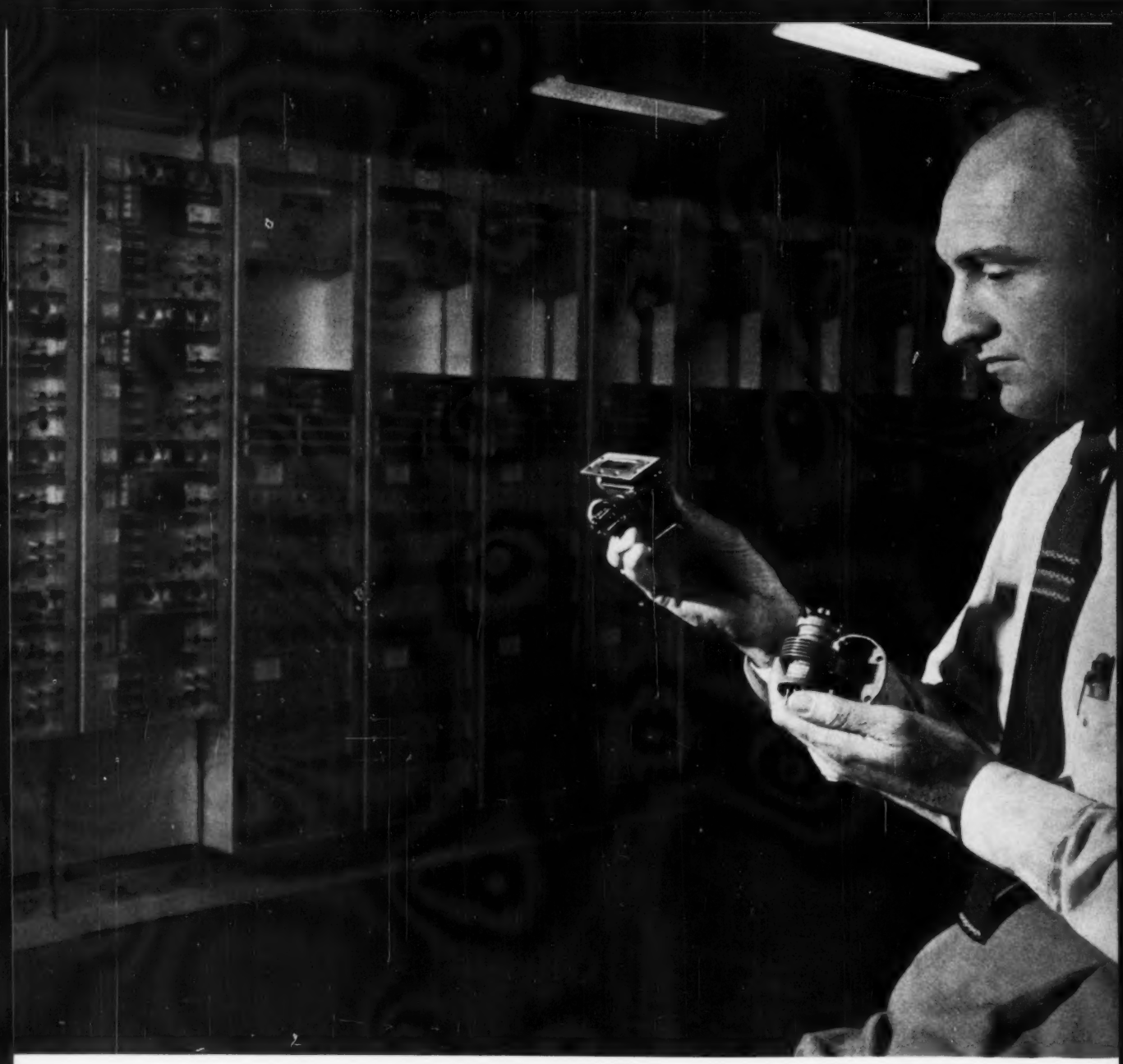
Why you get more from Lenkurt Type 74A microwave–



Only *Lenkurt* microwave has tomorrow's

The Federal Communications Commission has proposed an immediate tightening of microwave frequency tolerances from today's ± .05% to ± .005%. Industry representatives have counter-proposed an immediate reduction to ± .02%, with a further reduction to ± .01% in 1965.

Lenkurt Microtel microwave equipment, alone, *already* meets the ± .02% requirement *without modification or additional equipment*. In fact, *existing* installations, with only a minor modification, will be able to hold a tolerance *better* than ± .01% . . . *better* than the industry's recommendation for 1965!



frequency stability already built in

Lenkurt Microtel achieves this performance because circuits and components were designed with tomorrow in mind. The heavy-duty one-watt klystron and the Invar reference cavity, for instance, neither use nor require temperature control to meet specifications. And automatic frequency control of the transmitter is *standard* on Lenkurt Microtel . . . it's not even available on most other microwave systems!

Our customers have come to expect such advanced thinking and engineering in all Lenkurt telecommunications products. Such "engineering for the future" saves you money, both in freedom from obsolescence and in greatly reduced maintenance expense.

With a complete product line, our experienced staff engineers are able to plan your systems efficiently and objectively. Call or write your nearest Automatic Electric representative, or the Director, Carrier & Radio Sales, Automatic Electric Sales Corporation, Northlake, Illinois.

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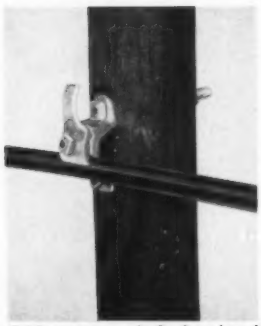

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4913

IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH, WASHINGTON EDITOR
AND EDITOR, PUBLIC UTILITIES FORTNIGHTLY

Bell System outlines plans for Space Communications via Satellites before FCC. . . . Stresses need for conservation of frequencies above 890 megacycles. FCC sets deadline for Western Union overseas cable service.

READERS of this department will recall that, last May, the Federal Communications Commission agreed to reopen the long-drawn-out and highly important radio frequency allocation case (Docket No. 11866) involving the divisions of frequencies above 890 megacycles on the radio spectrum. The purpose of this reopening at this late date was limited to receiving additional testimony regarding the frequency needs for space communications. Earlier this month the American Telephone & Telegraph Co. submitted some very interesting testimony on behalf of the Bell System and, of course, inferentially, on behalf of the telephone industry as a whole.

This testimony challenges the imagination of just about everybody in the telephone business. It is the sort of thing that would have seemed fantastic just a few years ago. But today we must realize that actual plans must be made for the relatively near future when long distance telephone calls to all parts of the world will probably be relayed via earth circling space satellites.

Bell Outlines Plan

The Bell testimony outlined a plan for a space communications network to carry telephone calls and television programs in this manner. The picture of future world-wide communications was contained in written testimony filed with the Federal Communications Commission by James B. Fisk, president of Bell Telephone Laboratories; John R. Pierce, the laboratories' director of research-communications principles; Charles M. Mapes, assistant chief engineer, AT&T; and Brockway McMillan, the laboratories' director of military research.

The Bell testimony was filed to support the Bell System's contention that the commission should anticipate the requirements of space communications in the portion of the spectrum above 890 megacycles. Mapes, in his testimony, said a system of about 50 satellites in random polar orbits at a height of about 3,000 miles could provide communications facilities between the United States and "all areas" of the world. He said about 26 transmitter-receiver stations, working in pairs and spotted throughout the world, would be needed to provide ground terminals. He said that "a very important advantage of such a satellite network is the ability to communicate directly with nearly all the major countries of the world, without intermediate facilities in other countries."

Cost of Satellite Relays

Mapes estimated the cost of setting up such a system at 115 million dollars —divided between 65 million dollars for the ground installations and 50 million for the satellites. Each pair of ground stations, relaying signals via satellites, could provide 600 telephone circuits. For about 55 million dollars, he said, the equipment could be adapted to also provide transoceanic television channels between each pair of stations. He said that "the cost, therefore, for providing the basic facilities for 600 telephone circuits and for television service between each of the 13 pairs of world-wide terminals would total approximately 170 million dollars."

The use and expense of a satellite system for international communication and, in collaboration with such foreign organizations as might be involved, would probably have to be shared between the various participating parties including the cost of launching and maintaining communication satellites.

Fisk described the need for better international communications. While radio-telephone and the growing network of submarine cables now supply telephone service to most of the world, they cannot supply all of the communications services that are available domestically. He said that the United States, with only 6 per cent of the world's population, now has 55 per cent of the telephones. Fisk stated that "we will necessarily expect a tremendous increase in telephones abroad as the 94 per cent of the world's people outside the United States become more industrialized. In addition to talking with many of these people by telephone, we will need to communicate with them by transmitting and receiving data and other business communications, and by means of television."

Must Be Beyond Horizon

Fisk thinks it would be impractical for satellite systems to share frequencies with cross-country microwave systems. He said that satellite system ground receivers can function only if they are well beyond the horizon from any ground microwave transmitters operating on the same frequency. Fisk observed that "our future in world communication and our future in the exploration and in the exploitation of space depend on the wise use of the

very limited range of frequencies in the electromagnetic spectrum which is suitable for satellite communication and for other space purposes."

In other words, the Bell people are convinced that "it is clearly in the public interest at this time for the commission (FCC) to conserve the use of the frequency spectrum and to maintain its earlier sound policy of restricting the licensing of private microwave systems." Fisk noted the most favorable frequencies for space communications range between 1,000 and 10,000 megacycles, although those up to 16,000 megacycles might be used. But he said that "natural laws" prevent the use of frequencies above 20,000 megacycles for reliable satellite communications. Frequencies about 890 megacycles also are needed for many military and governmental uses such as Nike radars and the spaceman Project Mercury.

Engaged in Research

The Bell Laboratories are engaged in an extensive program of experimental research aimed at bringing into being a world-wide commercial satellite communications system as early as possible. Fisk said, on this point, that "the Bell System would hope to have an active satellite system launched by a contractor just as soon as intensive development work now being carried out on satellites and the communication equipment to be carried in them gives assurance of reasonable technical and economic success."

Mapes, in his concluding testimony, said space communications were "absolutely necessary" to provide for the needs of the future. It seems that the Bell System has spent "sizable sums of money" for research on satellite communications and stands ready to spend "even larger sums" for experimentation, design, engineering, and construction. If the telephone industry can be assured of reasonably adequate frequencies to provide for the future it will continue this work. As Mapes put it: "If frequencies are available, there is no reason why America cannot lead the way in this new form of communication."

Project Echo Next

John R. Pierce gave the FCC an interesting account of Project Echo, which the National Aeronautics and Space Administration expects to launch in the near future. A 100-foot diameter, 130-pound aluminized plastic balloon will be launched in an orbit 1,000 miles high, reaching an extreme latitude of 48 degrees. A 10-kilowatt, 960.05-megacycle transmitter at Bell Telephone Laboratories at the Holmdel, N. J., location will illuminate the balloon, and the reflected signal will be received at the Jet Propulsion Laboratory's Goldstone station in California. The Goldstone installation in California will illuminate the balloon at 2,390 megacycles and the reflected signal will be received at the receiving station at Holmdel.

From this experiment it is expected that the life of passive balloon satellites in a space environment can be gauged. Changes in smoothness or shape of the balloon can be detected by means of radio. Circularly polarized waves will be transmitted and receivers for both circular polarizations will be provided. If the balloon is perfectly spherical, only one polarization will be received. Roughness of the balloon would also manifest itself by a fading signal. Passive satellite systems require satellites that will maintain a usable shape for long periods. The Echo experiment will also demonstrate propagation conditions, especially near the horizon.

The Echo experiment will relay two-way telephonic communication across the United States for periods of up to 16 minutes during a given circling of the earth, or "pass." The period of orbit will be about two hours (118 minutes). The satellite will be mutually visible at both terminals during five to seven successive passes, and then during five to seven succeeding passes it will be too far south at the longitude of the country to be seen at both terminals simultaneously.

Equipment Expensive

Finally, the Echo experiment is expected to provide experience with the many additional problems of satellite communication. In order to engage in the Echo experiment and to pursue other satellite communication research, it has been necessary for the Bell Telephone Laboratories to install a great deal of new complicated and expensive equipment on Crawford Hill near the Holmdel laboratory. The total cost of this equipment is about $600,000.

An unsuccessful attempt was made to orbit an Echo balloon on May 13 of

(Continued on page 56)

REA Approves Three Loans

Three telephone loans were approved during the week of July 4 by the Rural Electrification Administration as follows:

Randolph Telephone Co., Liberty, N. C.; $259,000; July 8.

Funds will be used to help provide facilities to serve 429 new subscribers in the company's present service area. On completion of the facilities planned with the assistance of this and prior REA loans, the borrower will be furnishing new and improved service to 1,296 subscribers. The completed system will encompass the Liberty exchange which now furnishes dial service to more than 900 subscribers.

•

New State Telephone Co., Roosevelt, Okla.; $125,000; July 8.

With the aid of this loan, it is planned to improve service for 107 subscribers and to furnish initial service for 70 subscribers. The borrower has recently acquired the Indiahoma Telephone Exchange, which has been furnishing magneto service to the present subscribers. Provision is made in the loan to reimburse the borrower for this acquisition. Construction planned by the borrower includes a new dial central office at Indiahoma.

On completion of the facilities provided for in this and prior REA loans, the New State company will be helped to furnish new and improved service to 3,991 subscribers. The completed system will consist of 11 exchanges. Seven are now furnishing dial service to approximately 2,040 subscribers.

•

Home Telephone Co. of Simpsonville, S. C.; $167,000; July 8.

These and funds from prior loans will assist the borrower in furnishing initial service to 200 subscribers in its service area.

On completion of the facilities provided for in this and prior REA loans, the borrower will have been aided in furnishing new and improved service to 1,698 subscribers. The completed system will be served through the Simpsonville exchange which now furnishes dial service to approximately 1,165 of the subscribers.

Laying cable by helicopter.

Combat Communications System

By I. T. STONEBACK*

IN MODERN mobile warfare, wire communication systems must be installed at extremely high speeds in order to support the rapid forward movement of combat troops. Field communication systems must transmit multi-channel voice conversations and digital information to electronic devices that seek targets and that fire weapons. Consequently, low attenuation broadband cables with efficient crosstalk suppression and amplifiers capable of surviving combat conditions are mandatory.

A major advance toward accomplishing these objectives is a rugged cable that carries 48 simultaneous two-way conversations and a method of packaging that permits *aerial* laying, by helicopter, of a continuous 10-mile cable length at 100 mph. A technique for laying cable at this high speed has been demonstrated to be completely practical by a series of U. S. Army Signal Corps field tests. One of the superiorities of this technique over other methods of aerially laying cable is its ability to pay out heavy amplifiers and large connectors without requiring the aircraft to slacken its speed.

Developed by ITT

The cable, packaging and laying technique were developed by International Telephone & Telegraph Laboratories, Nutley, N. J., under the guidance and direction of the U. S. Army Signal Research and Development Laboratory, Fort Monmouth, N. J.

In field trials, cable has been laid at speeds of zero to 100 mph from altitudes of 6 to 300 feet. The cable lies along any path flown by the helicopter, including turns. It can be laid with such accuracy that it is possible to suspend it in trees in order to cross rivers and roads.

Cable Requirements

The contract required development of a cable for a frequency division multiplex system to transmit 48 carrier telephone channels at a top frequency of 500 kc. The distance between attended points was specified as 20 miles

*Mr. Stoneback is Executive Engineer of International Telephone & Telegraph Laboratories, Nutley, N. J.

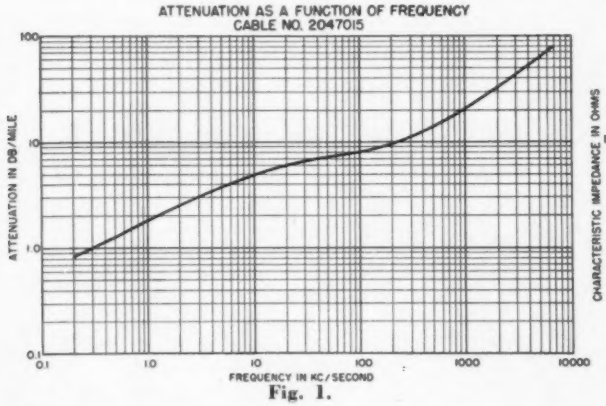


Fig. 1.

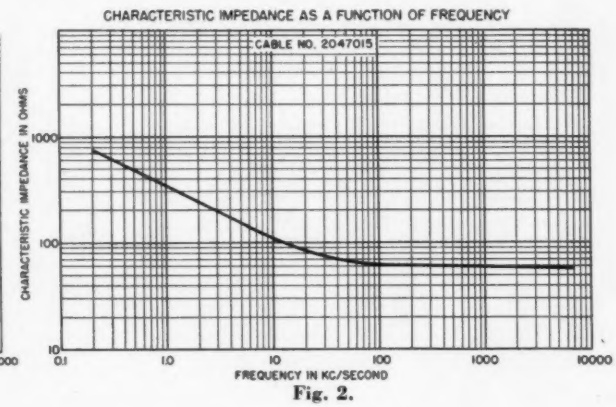


Fig. 2.

and the minimum spacing of unattended amplifiers was 2 miles.

In addition to meeting specified standards for noise, crosstalk, and attenuation, the cable was required to be light, flexible, rugged, waterproof, electrically and mechanically stable, and capable of being paid out from rotary wing aircraft. The cable attenuation, characteristic impedance, and surface transfer impedance as functions of frequency are shown in *Figs. 1*, *2*, and *3*, respectively.

Total amplified crosstalk and static noise were determined by the following equations:

Where

$$X_{NE_T} = X_{NE} - aS - 10 \log_{10} \frac{L}{S}.$$

$$No_T = No + aS + 10 \log_{10} \frac{L}{S} - Io.$$

X_{NE_T} = Total amplified near-end cross-talk.
No_T = Total amplified static noise.
X_{NE} = Unamplified near-end cross-talk.
No = Unamplified static noise.
a = Cable attenuation in db per mile.
S = Repeater spacing in miles.
L = System length in miles.
Io = System input in dbm.

Curves Developed

Curves resulting from the previous equations are given in *Figs. 4* and *5*. Allowable frequency of operation with respect to crosstalk is given by that portion of the curve in *Fig. 4* which is above the 25 db limit. For a two-mile repeater spacing, this is the region between 110 kc and 1000 kc. Allowable frequency of operation with respect to static noise is given by that portion of the curve in *Fig. 5*, which is below the 31 db limit. For a 2-mile amplifier spacing this is between 135 kc and 810 kc. The amplification requirement is plotted along with crosstalk and noise curves. The limit of amplified gain is established at 30 db which limits the upper end both of crosstalk and of noise bandwidth to 530 kc. However, a net bandwidth of 395 kc, even considering attenuation, noise, and crosstalk, is realized in the region between 135 kc and 530 kc for a 2-mile amplifier spacing. This is ample room for a 48-channel system, assuming a 4 kc per channel and a 6 kc separation between groups of 12 channels.

The selection of the type of cable facility for this system was a result of an analysis of all possible carrier constructions and a consideration of electrical and mechanical requirements. An additional feature, that of providing for unattended amplifiers to be air laid along with the cable, gave rise to the first major consideration, i.e., whether the system design should be based on a two-wire or four-wire facility.

Four-wire Selected

A two-wire system does not permit flexible field application, in that it is necessary to observe carefully the directional properties of all the unattended repeaters in a section. Reversal of one repeater within a section will prohibit operation entirely until the situation is corrected.

Flexible field application is also sacrificed in a two-wire system in re-routing and re-assignments of circuits. When frequent changes are being made, it is not desirable to have to consider the system's directional properties.

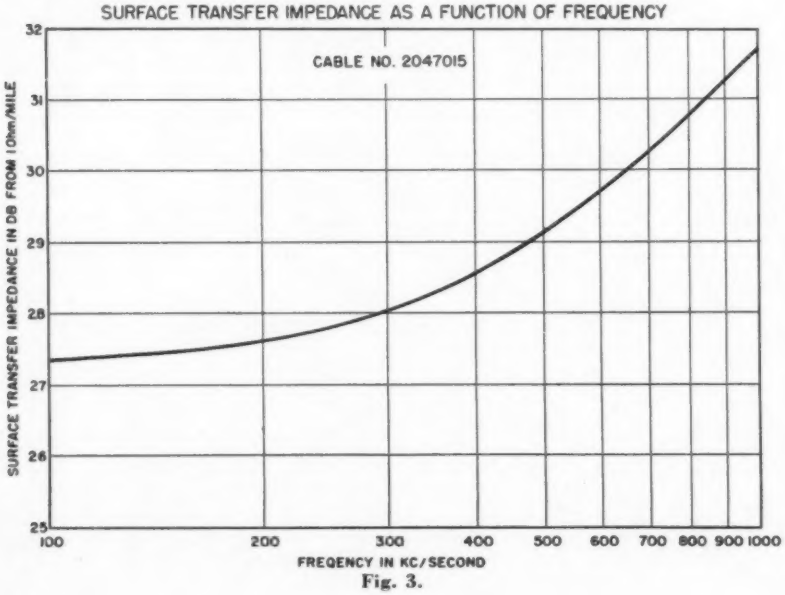


Fig. 3.

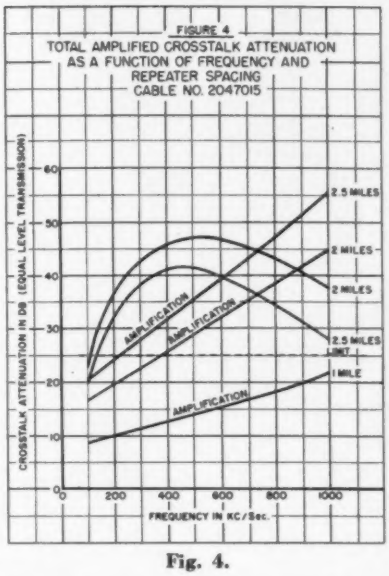


Fig. 4.

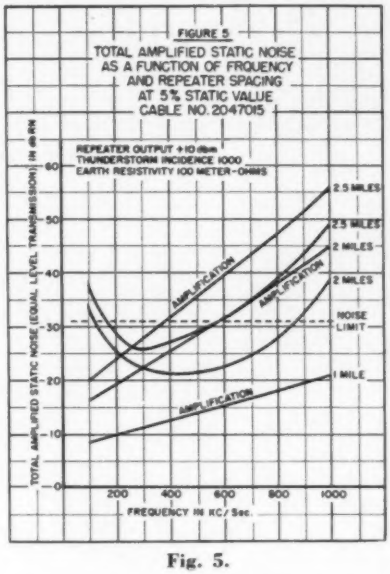
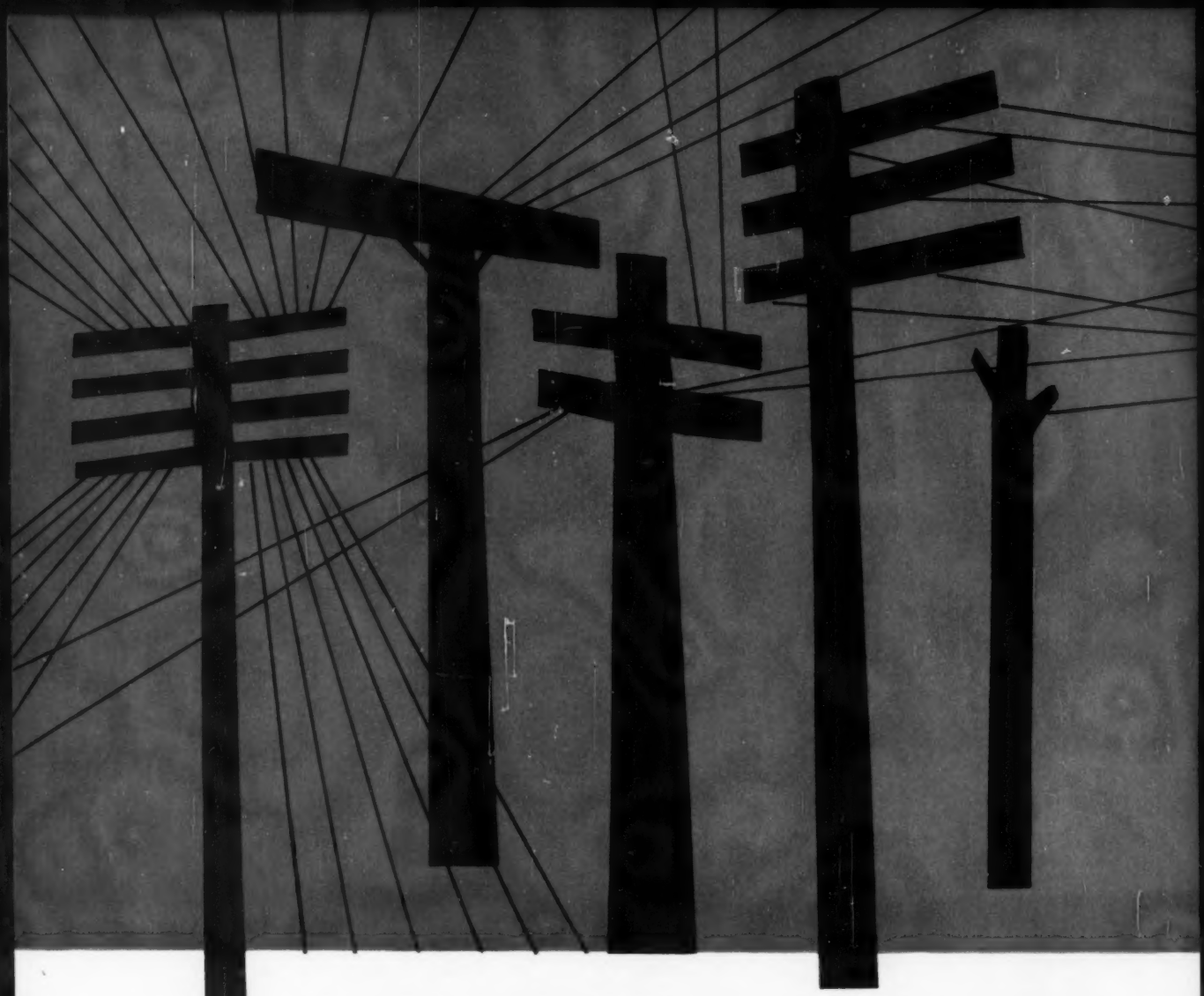


Fig. 5.

Although the basic disadvantage of a four-wire system for this application is the greater cable bulk per mile compared with a two-wire system, the fact that directional filters are not required outweighs this disadvantage. The bulk and weight of an amplifier is reduced to an absolute minimum when a four-wire system is employed. Since the same frequency spectrum is used for both directions of transmission, the amplifier has no inherent directional properties, thus eliminating the possibility of inserting a repeater in a wrong direction in the system. In addition, there are no directional problems in re-assignment and re-routing of the cable, since the four-wire structure can be made a symmetrical in the two directions of transmission.

(Continued on page 24)



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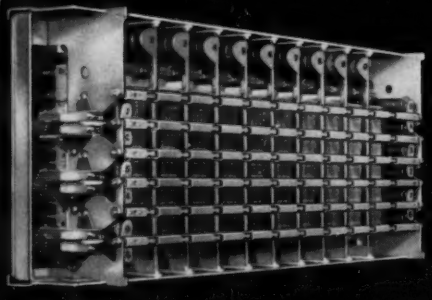
THE DYNAMIC FORCE IN THE TELEPHONE INDUSTRY

NORTH ELECTRIC COMPANY

Galion, Ohio



60-T-5

Twin Coaxial

Of the various four-wire structures considered, (star quad, bell or toll quad, and the twin coaxial), the twin coaxial provided the most satisfactory communications systems.

In the two coaxial structure, the "go" and "return" circuits are on individual coaxial cables twisted together. Ideally, this structure provides a minimum of crosstalk coupling and due to its coaxial structure, noise and interference pickup are minimized. Transmission is substantially unaffected by weather variations with the inevitable exception of variations due to external temperature.

At the beginning of the development, a group of twin coaxial cables was designed and constructed for comparison of performance. A combination of bare copper and copper-covered steel wire was used for the various constructions. Each metal was used for the two conducting members of the single coaxial, supplying strength in one member and high conductivity in the other. A ratio of dielectric diameter to inner conductor diameter of 3.6 to 1 was chosen because of transmission efficiency inherent in coaxial structures of this size.

Objectionable Features

Features which were found to be objectionable in the first group of cables constructed were as follows:

(1) Copper employed in both conducting members did not supply sufficient strength.
(2) Cables employing copper-covered steel wires in either conducting member exhibited excessive loss due to low conductivity and high dc resistance.
(3) Solid inner conductors were mechanically unreliable.
(4) A minimum weight per mile set by the Signal Corps as a target could not be met without sacrifice in electrical and mechanical properties.

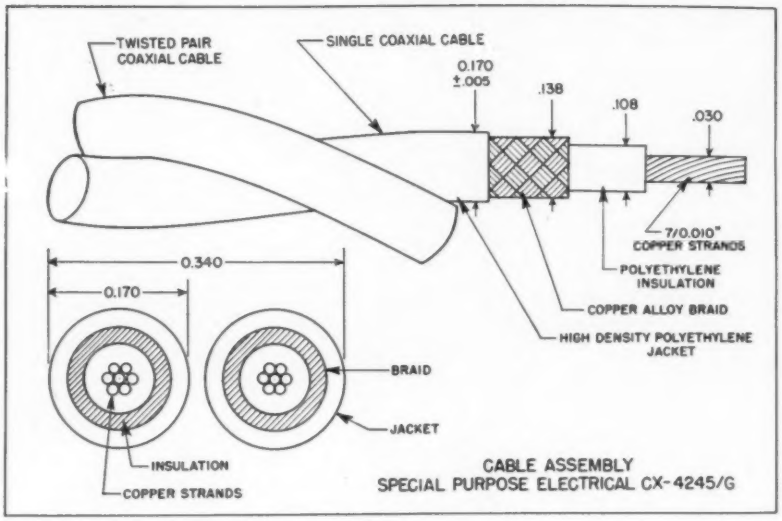


Fig. 6.

A second group of cables was constructed in an effort to improve breaking strength and attenuation, to select acceptable dielectric and jacket materials, and to measure the level of noise and crosstalk.

A cadmium-copper alloy was selected, because of its high tensile strength and high conductivity (85 per cent of that of bare copper), for use both as inner and outer conductors. High-density polyethylene was employed both as dielectric and as jacket material to take advantage of its toughness. All braids were constructed with 98 per cent optical coverage so that a minimum of field leakage would be expected.

Copper Alloy Conductors

Acceptable tensile strengths were obtained with cables constructed of copper alloy conductors. Weight was reduced by changing the ratio of dielectric diameter to inner conductor diameter to 3.0 to 1. However, attenuation and dc resistance failed to meet the requirements of electrical loss. This was due to the use of the copper alloy in both conducting members.

To overcome the deficiency in attenuation, the inner conductor was increased in diameter and its material changed to copper. Strength and attenuation values within specification limits were then obtained.

Rugged Testing

A wear test to determine relative resistance to impact, crushing, and abrasion was performed on all cable samples by placing specimens across a trap-rock-filled bituminous roadbed at right angles to the flow of traffic.

This wear test, which was exceptionally severe, gave several interesting results. The inner conductor and polyethylene dielectric of the coaxial samples exhibited no wear or distortion after the jacket had completely failed, exposing areas of bare braid. It was

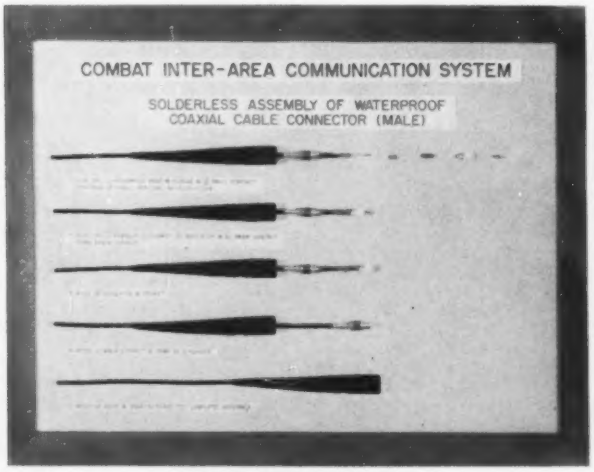


Fig. 7. Male connector.

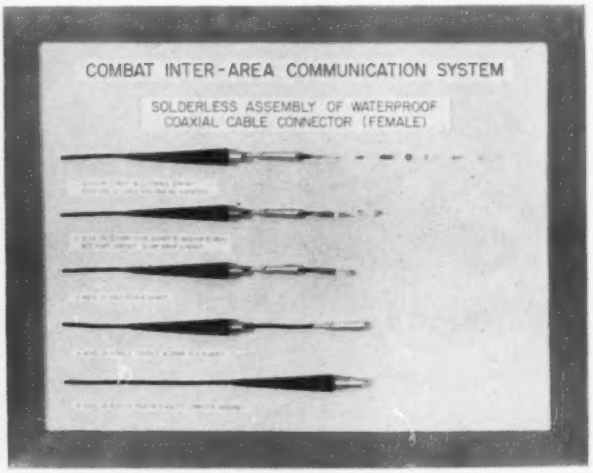


Fig. 8. Female connector.

Fig. 9. Cable carrier.

determined that a harder high-density polyethylene was not required as a dielectric. Furthermore, a cable sample with a high-density polyethylene dielectric actually caused the cable jacket to wear at an accelerated rate. High-density polyethylene as a jacket material exhibited at least a 50 per cent greater wear life than regular polyethylene.

Measurements of surface transfer impedance were performed to determine the relative shielding effectiveness of each braid construction. Several cables exhibiting acceptable strength, loss and low surface transfer impedance were selected for evaluation with respect to noise and crosstalk.

Increased Shielding

It was found that increased shielding was needed to meet system noise requirements. Crosstalk coupling was at a tolerable level and would be expected to improve with any revision in the shielding effectiveness causing an improvement in static noise level.

A complete study of the experimental braid data and an analysis of the braid current distribution established an efficient braid construction as one in which the angle between two crossing carriers is 90 degrees. A cable constructed with a braid based on this theory confirmed the value of braid angle control. It was then possible to construct a coaxial cable with essentially a constant surface transfer impedance within the frequency range from 0 to 1 mc. The weight of wire in the outer conductor could not be reduced further without exceeding the attenuation limit. The total weight of the final cable design was only 200 lbs. per mile.

As shown in *Fig. 6*, the construction of the finally developed cable comprises (1) a center conductor made up of seven strands of 0.010" bare soft drawn copper, (2) regular electrical grade polyethylene as the dielectric material, (3) a copper alloy braid with 2/2 weave, 16 carrier, 7 ends per carriers, 12 picks per inch minimum, and (4) high-density polyethylene jacket.

The copper alloy is known commercially as alloy No. 85 in accordance with ASTM specification B-105.

Connector Considerations

A unique Preformed coaxial connector was developed for this system. It combines electrical performance and extreme mechanical toughness with essential human engineering considerations. *Figs. 7* and *8* show the male and female connectors.

Although the smallest possible overall connector diameter would be ideal for aerial payout requirements, the diameter for this connector was purposely made large (13/16 inch) so that it could be mated by personnel wearing heavy mittens under arctic conditions. The coupling sleeve was also made long (2 inches) to permit simple handling. One half of the sleeve has a double knurl to identify it by sight and touch from the other half which has a single knurl.

The entire connector is neoprene-covered to prevent the hazard of electrical shock. The neoprene covering also serves as a resilient material to absorb mechanical shock and protect the mated connectors from damage normally caused by improper handling.

The connectors are factory assembled to lengths of cable thereby reducing the field operation to the simple mating of the male and female connectors. The mating is accomplished by four turns of the coupling sleeve which is attached to the male connectors. A double lead thread is used in the sleeve to provide maximum strength with the fewest possible coupling turns.

Two Connectors at Each End

Two connectors are used at each end of the cable length since the cable is actually two coaxial cables twisted together and each has its own connector. To prevent mismating by unskilled personnel, the ends of the individual coaxial cables are staggered. A female connector is assembled to one coaxial cable about 2 feet ahead of the male connector which is assembled to the other coaxial cable. Since each individual cable has a male connector on one end and a female connector on the other, continuity is assured throughout the system.

The assembly of the connectors to the cable does not involve solder as all contacts are crimped. This method of construction eliminates all variations due to operator skill since the crimping tools will not permit a partial or incomplete crimp.

Fabrication by the method previously described resulted in an extremely rugged connector. Mated connectors have been repeatedly dropped from heights greater than 300 feet and run over by six-ton trucks without damage or deformation of any sort. After immersion for one month in water, or after being subjected to a standard 10-day humidity cycle, or five cycles of thermal shock, the connector's insulation resistance remained greater than 10^6 megohms. A tensile force of 150 to 200 pounds is required to separate the connector from the cable. This is twice the force required to separate conventional connectors. The breakdown voltage between the conductors within the connector is in excess of 1,500 volts rms at 60 cycles.

As shown in *Fig. 9*, the cable carrier consists of an aluminum alloy

(Continued on page 54)

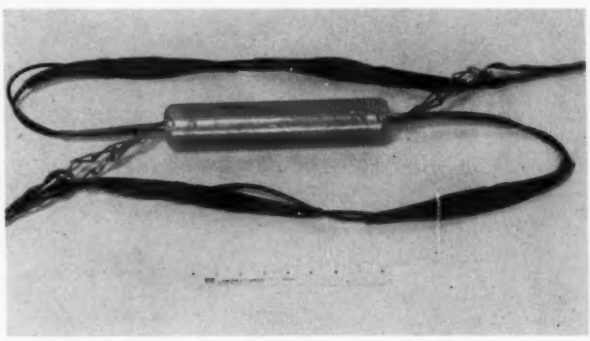


Fig. 10. Amplifier.

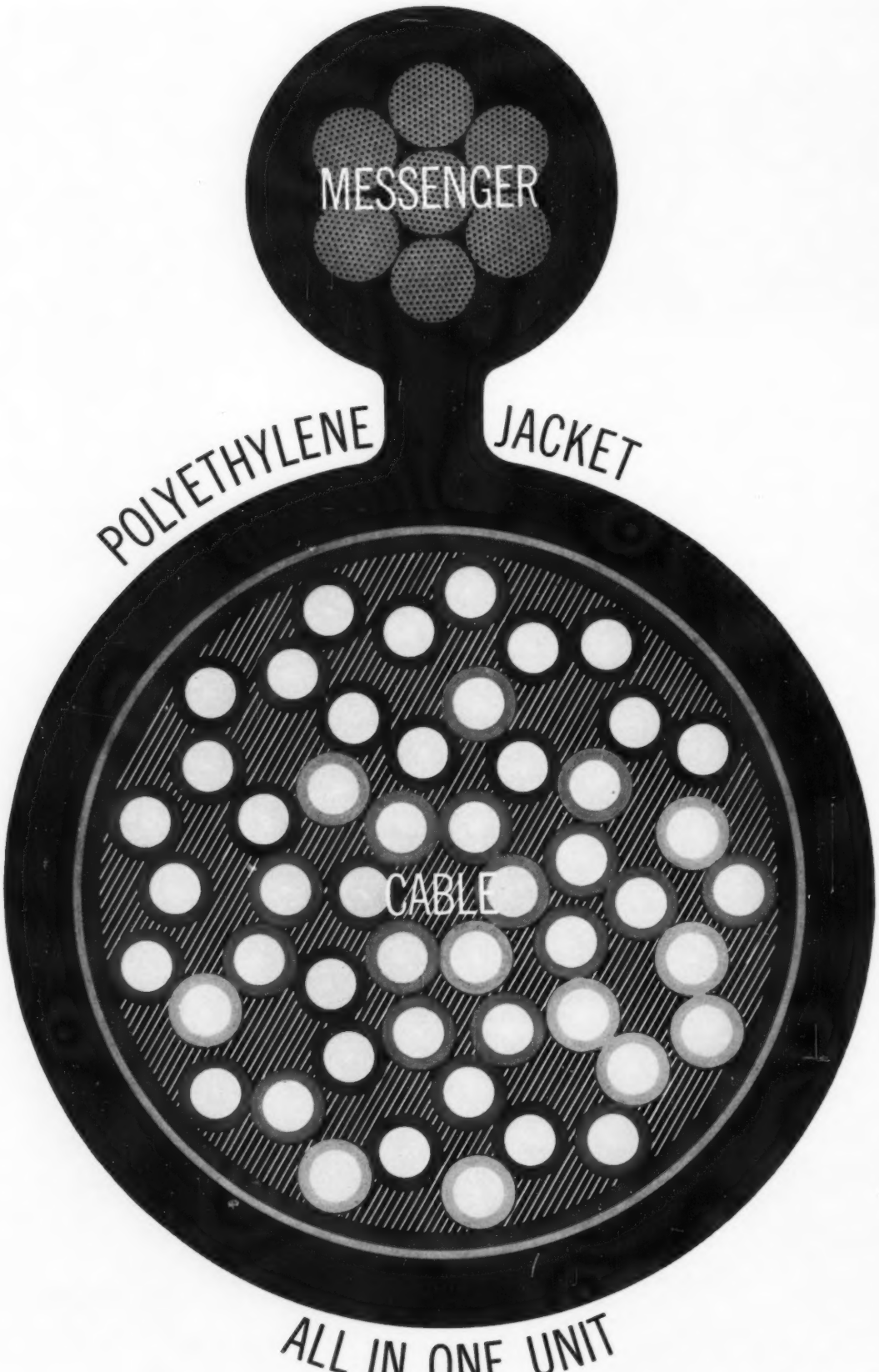

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FIGURE 8

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The unique construction of Figure 8 Exchange Cable cuts installation costs, as proven recently in the field. No need for separate installation of cable, messenger and subsequent field sunning . . . it goes up as one easy operation. And there's no special splicing procedure necessary, normal practices for splicing and closures apply (figure 1). To further speed installation, a specially designed clamp which grips the messenger has been developed for tangent supports (figure 2). Call our distributors and get all the facts about this outstanding new cable development . . . designed and manufactured by General Cable for the Independent Telephone Systems of America. Distributed by: Automatic Electric Sales Corp., Northlake, Ill., Leich Sales Corp., 427 W. Randolph St., Chicago 6, Ill.

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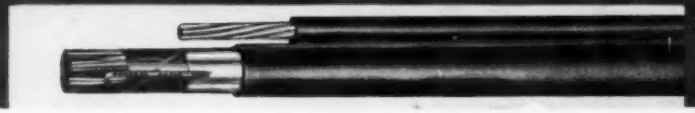

Annual Review of

NEW PRODUCTS AND TECHNIQUES

By RAY BLAIN

THIS IS THE seventh article in a series describing various new items of equipment and their application in telephony.

The sixth article appeared in the July 16 issue.

Readers desiring additional information on any of the products described, should write the manufacturer or TELEPHONY.

* * *

New Battery Charger (Fig. 107). Cook also has announced a new battery charger.

In this new charger, the circuitry is completely static and only conservatively rated magnetic amplifiers, silicon diodes and wire-wound resistors are utilized. Even with flat batteries, the built-in, current protection circuit limits its charging current to 125 per cent of rated output. Terminals are available for external referencing when units are to be operated in parallel.

Fig. 107. Battery charger.

Regulation of better than ½ per cent prevents the three major causes of battery failure—loss of water, gassing and sulfation, Cook states.

In the event of ac power failure, the alarm circuit is actuated and the batteries are disconnected from the charger, avoiding the possibility of the batteries discharging through the charger.

An optional feature includes a relay that disconnects the battery charger from the batteries and actuates an alarm circuit whenever loss of charging current occurs, whether it is caused by ac power failure, an internal failure in the charger, blown output fuse or any condition that might cause the output of the charger to fall below the battery voltage.

•

Build-Out Units for Cables (Fig. 108). Transmission loss in non-loaded cable is mainly due to the resistance and capacitance characteristics of the cable. Loss can be reduced by using larger gauge wires and/or lower capacitance cables. However, this is usually economically impracticable.

Instead of changing the physical features of the cable, the economical way is to improve the cable's electrical characteristics. The capacitive effect of

Fig. 108. Build-out units for cables.

cable can be practically eliminated by adding the proper amount of inductance. Ideally, this inductance should be in micro-microhenries and installed every few inches. Of course, this is out of the question.

The practical method that achieves the desired result is to install larger lumped inductances at regular intervals. This is called cable loading.

Loading today has been standardized with 88 millihenry coils spaced at 6,000 foot intervals. This is H88 type loading. Here, then, cable build-out becomes important. As is often the situation, the 6,000-foot spacing between coils cannot be maintained.

The effects of spacing irregularities up to about 500 feet are for all prac-

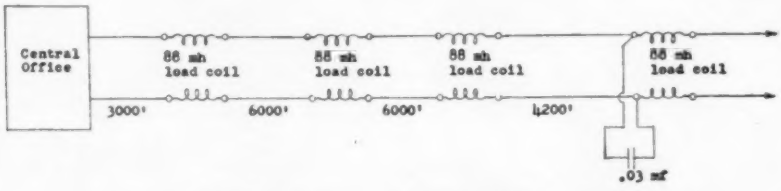

Fig. 109. Building out a short loading section.

tical purposes unnoticeable. Irregularities up to about 200 feet are nearly impossible to measure. Larger irregularities, over 500 feet, have a definite detrimental effect on transmission, especially when repeaters are required on the loaded circuits. Consequently, added capacitance in the form of Build-Out units, such as those manufactured by Communication Equipment & Engineering Co., will effectively eliminate such spacing irregularities.

For example: Assume the situation where a circuit is loaded as follows. A 3,000-foot section next to the office provides a normal spacing to other loaded circuits from that office. (See *Fig. 109.)*

Fig. 109 shows 22-gauge cable with a capacitance of .084 microfarads per mile or .016 mf per 1,000 feet. The spacing irregularity at the fourth load point can be corrected by installing a Build-Out unit with a .03 mf capacitor.

CEECO Build-Out capacitors can be installed in splicing sleeves where only a few pairs are involved. Build-Out units in cases should be used when a large number of pairs are involved. These capacitors are ± 3 per cent of specified value with a working voltage maximum of 1,000 volts dc. Special requirements can be filled on request.

•

Preformed Communications Tie (Fig. 110). This is a fast, easy, economical way to make a "good tie" without tools.

Fig. 110. Preformed communications tie.

The one-piece tie refuses to be applied incorrectly; assures uniformity of application all along the line; creates a protective cradle for the conductor, eliminating direct contact with the insulator. Sizes available are for use on .080 inch and .102 inch-.104 inch copper-covered steel and .109 inch galvanized steel open line wire and for five popular types of insulators. It is a product of Preformed Line Products Co.

•

Preformed One-Piece Plastic Spacer Unit (Fig. 111). This device eliminates mid-span hits on open line wire, thus

Fig. 111. Preformed one-piece plastic spacer unit.

permitting longer span construction with EHS line wire. Two basic types are available: One for direct application at mid-span locations; the other for slip type application. A range of sizes permits spacing of 5 inches, 6 inches, 8 inches, 10 inches and 12 inches of .080 inch, .102 inch and .109 inch open line wire.

•

Preformed One-Piece Plastic Pinch Bracket (Fig. 112). This bracket establishes cradled, controlled, four-inch spacing of open line wires between transposition points. It also eliminates five parts: An insulator, a steel plate, a steel pin, and two bolts of the conventional pinch bracket assembly. Attachment, made entirely by hand, is quick and easy, and assures uniformity of application.

Fig. 112. Preformed one-piece plastic pinch bracket.

•

Preformed One-Piece Plastic Vibration Damper (Fig. 113). This damper arrests vibration on open line wire. The unit is simply wrapped onto the wire near a support point where the potential fatigue damage is greatest. This damper will not spin or ride even on downhill construction. Offered in one

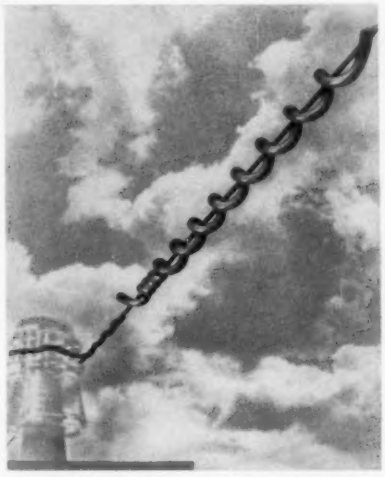

Fig. 113. Preformed one-piece plastic vibration damper.

size to accommodate the full range of open line wire diameters.

•

Preformed Cabled-Loop Guy-Grip Dead-Ends (Fig. 114). This device is claimed to be a major advancement in easier tensioning with a compact, more durable loop that looks just like the strand and "seats" more readily in the

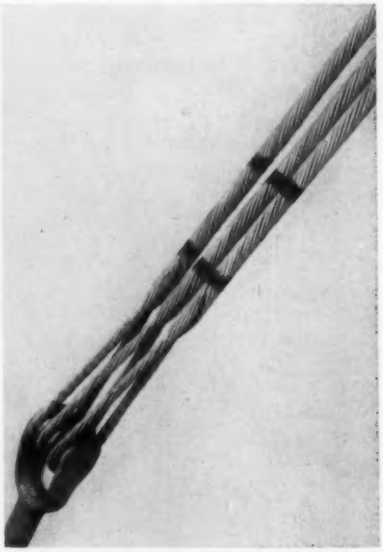

Fig. 114. Preformed cabled-loop guy-grip dead-ends.

grooves of the anchor rod. Like the open-helix Guy-Grip dead-end, the cabled-loop design holds 100 per cent of the rated breaking strength of the strand. The narrower, tightly cabled loop, is more adaptable for multiple guying. The new dead-ends are available for use at the top, breaker and anchor locations, and for popular sizes of strand.

•

Preformed One-Piece Crossarm Tangent Support (Fig. 115). This device is used to support one-pair aerial distribution wire from the crossarm. It is ideal in situations where: (a) Pole climbing clearance is required; (b) ground clearance would be insufficient if wires were suspended from poles; (c) a greater number of wires demand the use of crossarms instead of poles.

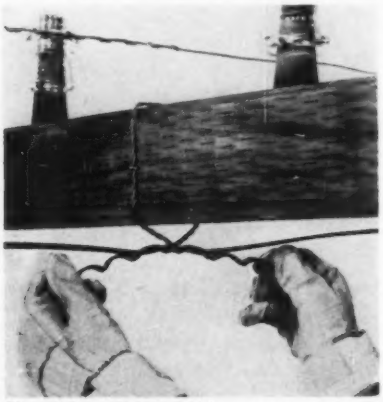

Fig. 115. Preformed one-piece crossarm tangent support.

The crossarm tangent support is easy to apply. The loop is slipped over the crossarm and secured with two staples. Then the legs are wrapped onto the wire. The legs are neoprene-coated to "cradle" the wire and protect it from abrasion. Available for wire sizes 2#14 and 2#12 copper-covered steel and 2#.083 inch steel.

•

Preformed Elongated Loop Tangent Support (Fig. 116). This support provides an economical means of stringing two lines of one-pair aerial distribution wire (C-Rural) utilizing a single drive hook at each support point. The long loop also establishes a fixed dimension between lines at the pole. No tools are required for application. The elongated loop tangent support is used ideally as companion hardware with the Preformed standard loop tangent support. Sizes available to fit 2#14 and 2#12 copper-covered steel and 2#.083 inch steel wire.

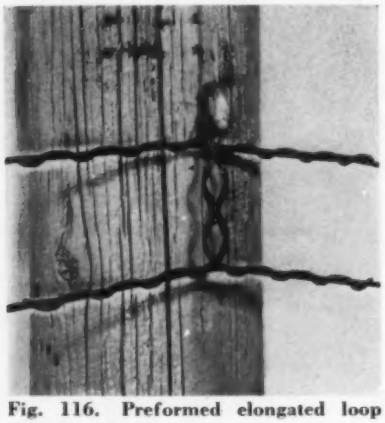

Fig. 116. Preformed elongated loop tangent support.

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Preformed Gritted Armor Rods (Fig. 117). These adapters are applied over insulation of rural distribution wire

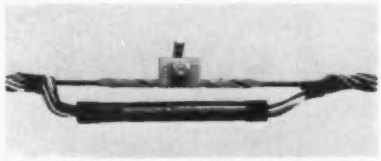


Fig. 117. Preformed gritted armor rods.

(B-Rural) messenger. The armor rods, quickly and easily applied by hand, provide protective armor and increase diameter of messenger to accommodate D span clamps or splice case attachments. This permits installation of service drop directly off the messenger and at a convenient point away from the pole. It also provides climbing clearance.

•

Pre-Wired Telephone Service in New Buildings. For many years it has been standard practice for architects to indicate electrical power outlets, wiring and conduit paths, and even power control and electrical fuse box equipment of various types in new structures. Why not do the same for telephone service?

It has long been apparent to many operating telephone companies that an extremely helpful sales device for obtaining optimum telephone instrument and service use in new structures could be accomplished by obtaining the architectural specification of convenient telephone outlets in most rooms in a new house or office building. In addition, the high cost of installing initial facilities to the operating telephone company has brought about a great interest in working with the electrical sub-contractor during a construction period, performing some of the prewiring work for him so that costs could be included as part of the new house. Such costs represent a very small addition to the over-all cost of the structure and the increased value to the builder and purchaser is considerable.

Standard hardware is now available that is especially designed to provide pre-wired telephone service at a reasonable cost. Some of these items, available from Suttle Equipment Corp., will be described briefly in the next six paragraphs.

•

Standard Plug and Jack Assembly (Fig. 118). This bracket is heavy cad-

(Continued on page 60)

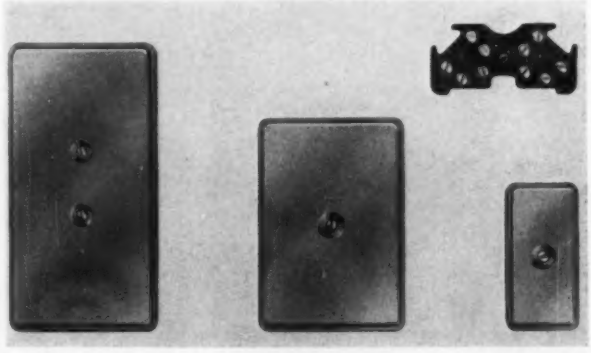


Fig. 119. Connecting blocks.

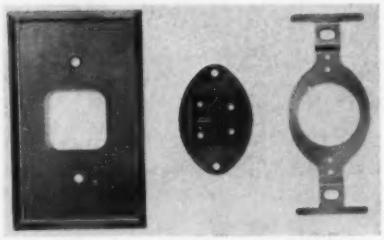


Fig. 118. Standard plug and jack assembly.

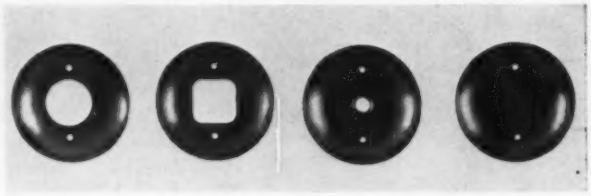


Fig. 120. Face plates.

California Speakers Stress

- *Morality in public office*
- *Spiritual values and faith*
- *Technology role in defense*

*By George A. Bridges**

SAN FRANCISCO, on June 8 and 9, was headquarters for over 600 members and guests attending the 41st annual California Independent Telephone Association convention, in session at the Fairmont Hotel.

The first speaker was Everett C. McKeage, president of the California Public Utilities Commission, who discussed "Morality in Public Office."

Mr. McKeage brought out various examples, both of morality, and of immorality, in past years from the beginning of our country, emphasizing the need for a high degree of morality on the part of officials, elected or appointed.

On the matter of a public utility and its conduct, he said:

"It appears to me that all any public utility should ask for is fair treatment at the hands of public authority. I fully realize that the expression 'fair treatment' is a relative one, and what a regulator might believe to be fair treatment to a public utility, might not appear so to the public utility. Justice can only be substantial—it rarely ever can be exact. . . .

"May I offer this thought to any of those members of a regulated industry who may seek, by unlawful influence, or other unlawful means, to secure favor from a regulator, that the regulator who will thus 'sell' himself will, also, sell himself to a higher bidder. In my judgment, it is just as important for the regulated industry to plow an ethical course as it is for the regulator to do so. . . .

"There should be cordial but correct official relations between the regulator and the regulated. No regulator should make the mistake of becoming a 'pal' of any representative of the regulated industry, nor of any representative of any interest opposing the regulated industry.

"Based upon more than 15 years of experience in the regulatory field, I assert that there are selfish consumer interests, just as there are selfish public utility interests. Both of these selfish interests must be recognized by the regulator for what they are."

In conclusion, Mr. McKeage stated, "The regulator, like all other public officials, must ever keep in mind that, as Thomas Jefferson said, 'gratitude' is to be found only in the lexicon. His reward for honest and faithful public service will consist of a clear conscience and the honest belief that he did his best for the public interest."

Following the McKeage talk, Donald H. Strahl, president of the CITA, welcomed the assemblage to the convention and presented highlights of his 1959-60 term of office.

At the conclusion of the president's address, Neal C. Hasbrook, secretary-treasurer of the CITA, presented his report, and announced that the 1961 California convention will be held in Honolulu, Hawaii, with the Hawaiian Village Hotel as headquarters.

Panel discussions on marketing and sales and plant management problems were also features of the first day of the convention.

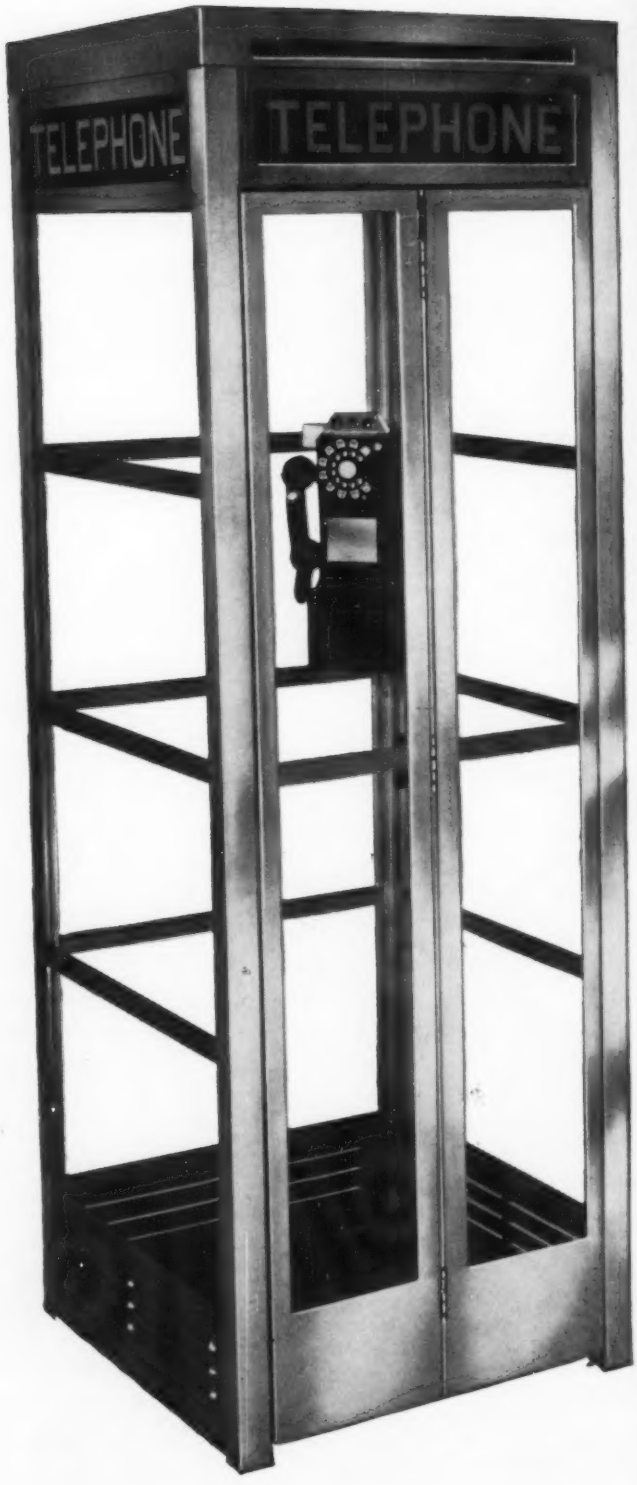
For the marketing and sales panel, George H. Gage, vice president-marketing and sales, for the General Tele-

(Continued on page 34)

*Mr. Bridges is Publicity Supervisor of the General Telephone Co. of California.

Facing a new term of office, the officers and directors of the California Independent Telephone Association for the 1960-61 term, pose for their first official photograph. In the foreground, seated, are Harlan W. Holmwood, new CITA president; and W. Gilman Snyder, first vice president. Standing (from left to right): Neal C. Hasbrook, secretary-treasurer; Allan R. Stacey, second vice president; Donald H. Strahl, outgoing president; and J. P. Maguire. Additional directors not present for the photograph include, Peter A. Nenzel and J. Curtis Newman.

NEW "COMPACT" ALCOA ALUMINUM BOOTH TAKES 26% LESS FLOOR SPACE !



Fits where no booth ever fitted before... stacks closer in high-revenue locations!

This new Alcoa® Aluminum "Compact" indoor booth adds revenue by providing convenient service with complete privacy in places no booth ever fitted before. Just 28¾ in. square, it takes 26 per cent less area than its bigger brother . . . saves valuable floor space in supermarkets, drugstores, office buildings, department stores and other busy locations.

Its flush roof lets the Alcoa "Compact" booth stack closer in tandem where traffic dictates to earn more revenue per square foot of floor space than any booth made before. Designed to harmonize with modern decor, the Alcoa "Compact" booth attracts passers-by with its clean appearance and slim lines. Ceiling vent fan and louvered bottom panel are optional.

Maintenance: minimum! Solidly built of heat-treated Alcoa Aluminum Extrusions, the Alcoa "Compact" booth resists damage and vandalism. Alumilite* finish stays bright and shiny with just an occasional washing down.

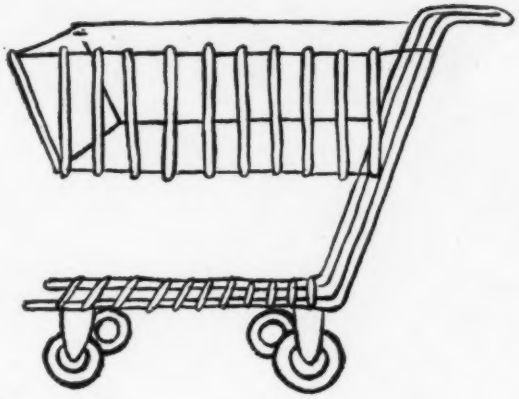
*Trade Name of Aluminum Company of America

Contact your telephone supply jobber for more information on the new Alcoa "Compact" indoor booth, or write for free folder: Aluminum Company of America, 1720-U Alcoa Building, Pittsburgh 19, Pa.

ALCOA ALUMINUM

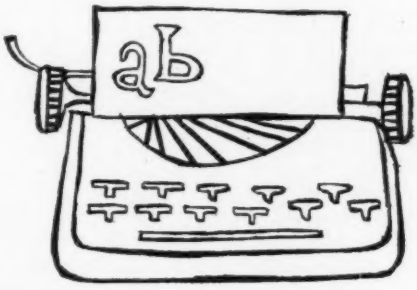
ALUMINUM COMPANY OF AMERICA

Alcoa "Compact" telephone booth goes where revenue is high:



Supermarkets

Drugstores



Office Buildings

Department Stores

Introducing profitable plant management panelists, John H. Barrows (standing), of California Interstate Telephone Co., acted as chairman. Other panelists (from left to right) include: William G. Sebastian, Kerman Telephone Co.; Harold Bright, California-Pacific Utilities Co.; Kenneth Adams, Dos Palos Telephone Co., Inc.; and W. Gilman Snyder, The Western Telephone Co.

phone Co., acted as chairman. He was assisted by Robert A. Dinsmore, California Interstate Telephone Co.; by Russell Landrus, California Water & Telephone Co., and Allan R. Stacey, of the Sunland-Tujunga Telephone Co.

California's 1960 convention program was highlighted by a new and refreshing approach to panel discussions through the appearance of the "Little Players" of the marketing and sales department of General Telephone who put on a series of skits, emphasizing the main points of the talks. Participants included Vurjeene Rust, Jack Corrodi, Vic Cravello and a professional model, Beverly Bridges of San Francisco.

Concurrent with the meeting of the marketing and sales panel, discussions by the profitable plant management panel were taking place. John H. Barrows, of the California Interstate Telephone Co., chairman, introduced the panel including: Kenneth Adams, Dos Palos Telephone Co., Inc.; Harold Bright, California-Pacific Utilities Co.; William G. Sebastian, of the Kerman Telephone Co.; and W. Gilman Snyder, of The Western Telephone Co.

On the morning of the second day of the meeting, two other panels held discussions on accounting and traffic problems.

Robert A. Lindsay, of Western California Telephone Co., as chairman of the accounting panel, was assisted by Frank J. Cristich, California Water & Telephone Co.; by John F. Donovan, of the California Public Utilities Commission; Perry L. Hunsaker, California Interstate Telephone Co.; and by Fred C. Mehl, of the Sunland-Tujunga Telephone Co.

Members of the traffic panel, serving under the chairmanship of D. A. Perigo, of the West Coast Telephone Co. of California, were: William Dales of California Interstate Telephone Co.; Mrs. Lois Dutro, of California Water & Telephone Co.; and H. R. Woodburn, of California-Oregon Telephone Co.

An inspirational message was brought before the association by Stary Gange, consultant for the Southern California Gas Co., and an exponent of the positive approach to living. His choice of title for his address, "Tomorrow Will Be a Busy Day," reflected his positive views and urged optimistic action.

Mr. Gange stated:

"We, as Americans, are sowing seeds for some of the greatest years in history, and as Americans, should permit the excitement and wonder of this crazy world to rub off on us by adopting the right attitude, since attitude is just as important as aptitude.

"The wonders of our government cannot be equalled by any other country in the world, since ours is a government without interference and it gives us the right to go broke. People will never reach the ladder of success without this privilege.

"It's sad when people are more interested in security than opportunity.

"Security goes along with change, and change is what makes the world go around.

"In order to cope with change, however, you must take a positive and enthusiastic approach toward the future.

"Enthusiasm is a spiritual quality and people cannot enthuse on a low level. Therefore, by being enthusiastic about life, you set up a chain reaction that is contagious, spreading to everyone who comes in contact with you."

Mr. Gange issued a ringing challenge to his audience to keep America awake and alert. "We must challenge the right people," he said, "and to do this, we must place more emphasis on the importance of education. We must honor young people who have high scholastic ratings and raise the standard of appreciation for intelligence among our young people.

"I am happy to report that in some educational institutions, the importance of scholastic achievement has been stressed so stringently that the 'hero image' has shifted from brawn to brain. Some high schools are even providing bands to honor the brilliant student.

"America needs highly trained minds, especially in the science fields . . . It is gratifying to see young people thinking about things their parents never thought of in the past, and being commended for it."

Concerning the spiritual side of life, he commented, "Coupled with well-equipped minds to man our country, it is imperative that we believe there is a God. Deep religious convictions point out the difference between profit and greed, and if we are to have a strong government, we must be able to distinguish this difference.

"We also need faith in our fellowman, and this is not impossible, for faith in each other is surprisingly contagious," he affirmed.

In concluding his address, Mr. Gange reverted to the theme of tomorrow and the busy day, saying, "The sign of the

Deep in the throes of accounting problems, Robert A. Lindsay (center) of Western California Telephone Co., acted as chairman of the accounting panel. Assisting him are (from left to right): Fred C. Mehl, Sunland-Tujunga Telephone Co.; John F. Donovan, California Public Utilities Commission; Frank J. Cristich, California Water & Telephone Co.; and Perry L. Hunsaker, California Interstate Telephone Co.

in the power field with Raytheon

Raytheon Company, Power Supply and Voltage Regulator Operations, Commercial Apparatus and Systems Division, Keeler Ave., South Norwalk, Conn.

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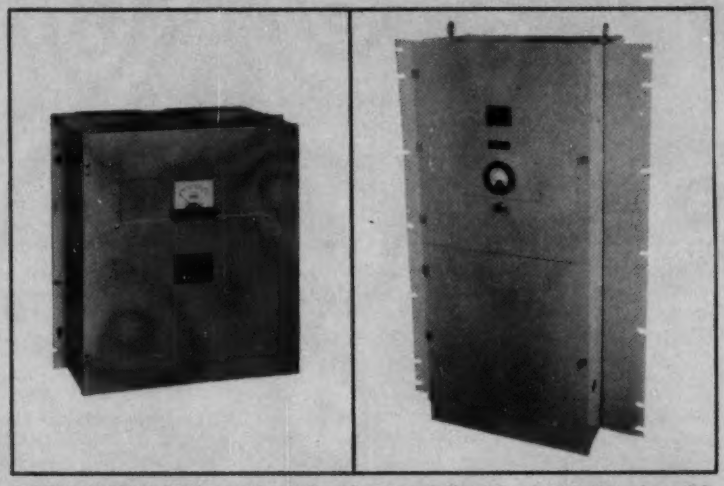
Solving special telephone power supply problems is routine work for Raytheon's factory trained field applications and service engineers. From Raytheon's complete line of equipment covering all major needs, they come up with the answer that best suits your particular requirements . . . and make certain that your equipment is properly installed and serviced.

In telephone exchanges throughout the country, Raytheon Rectichargers,® Rectiringers,® Rectifilters® and other power supply equipments are in service around the clock. You'll find them in applications ranging from toll-ticketing power to main dial installations serving 4,500 terminals or more. FOR ON-THE-SPOT SERVICE, from the Raytheon Sales and Service Office nearest you see the YELLOW PAGES or write to the address at right.



TYPICAL UNITS in Raytheon's broad line of modern battery charging equipment are this 18-amp., single phase, silicon Recticharger (left) and 25-amp., three-phase, silicon Recticharger (right).

NEW RAYTHEON BATTERY CHARGERS SMALLER, LIGHTER, MORE EFFICIENT

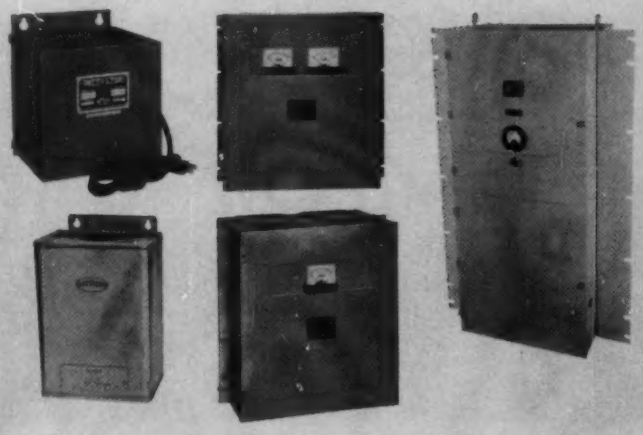
Raytheon's improved line of battery chargers now employ reliable silicon semiconductors for greatly improved rectifier efficiency. The thoroughly tested models are up to 50% smaller and lighter than comparable selenium units.

Typical Rectichargers shown above maintain batteries at full charge under all load conditions, and at the same time supply the full power requirements of the load. Output filtering reduces ripple to 30 millivolts, well below the audibility level. Output voltage is precisely regulated to within ± 1% from no load to full load and for line changes to ± 10%.

Raytheon telephone applications engineers are ready to demonstrate how Raytheon closely regulated battery chargers can bring longer battery life and significant reduction in battery maintenance to your installation. For information or engineering assistance, please write Raytheon Company, Power Supply and Voltage Regulator Operations, Commercial Apparatus and Systems Division, Keeler Avenue, South Norwalk, Connecticut.

A COMPLETE LINE OF POWER SUPPLY EQUIPMENT

RECTICHARGER BATTERY CHARGERS · 3 to 400 AMPS, 24, 50, 130 and 140 volts
RECTIFILTER BATTERY ELIMINATORS · RECTIRINGER RINGING POWER SUPPLIES · AUXILIARY CHARGERS · ALL POWER SUPPLY ACCESSORIES



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A telephone confab was taking place when this picture was taken. Standing in the lobby of the Fairmont Hotel (left to right): William Dales and Arthur L. Taylor, both of California Interstate Telephone Co.; Gayle Smith, California Pacific Utilities Co.; J. E. Bigelow, Ponderosa Telephone Co.; and Willard Wade, also of California Interstate.

new tomorrow is the torch of faith. If you return to the fundamentals of Christian living, you will be able to maintain that precious American gift —the individual right to be what you want to be."

Final speaker to come before the convention was Maj. Gen. John D. Stevenson, Commander, Western Air Defense Force, Hamilton Air Force Base, California, whose talk was entitled, "Air Defense of the North American Continent," and highlighted the tremendous developments which have come about in defense in the last decade.

General Stevenson provided a panoramic view of the nation's progress in weapons. To these almost incomprehensible achievements, he added an evaluation of the military communications link.

"The advent of the nuclear weapons and the jet engine has radically changed the nature of modern warfare," said Gen. Stevenson. "Greater changes have been wrought in the last 10 years than in the previous history of man on earth. The rocket engine of the ballistic missile compresses the time factor to minutes instead of hours.

"Air defense is a necessary ingredient in the support our Armed Forces must give our national policies. We will not strike the first blow, we must deliver a decisive retaliatory effort. We must not be caught on the ground; we must not let our enemy think he can catch us on the ground.

"The primary mission of our Armed Forces is to deter war—air defense plays a large part in fulfilling that mission. The air defense of our nation today is a system, a workable scientific system. It can today cope with the air-breathing threat (long-range bombers); tomorrow it will be in a better position to cope with a new threat - - - the ballistic missile.

"We are working toward the completion of a warning system against the ballistic missile: We do not have an answer to an active defense against it; and this problem is one of the greatest challenges ever to face the military strategist.

"We have nuclear weapons in today's weapon system inventory. The weapons systems of tomorrow will all have a nuclear capability.

"The increased destructive capability of the atomic warhead has markedly simplified the air defense problem. With or without atomic warheads, 100 per cent air defense is but wishful thinking.

"With or without atomic warheads, it is the air force philosophy that every attacker be destroyed as far from his targets as possible. Our plans call," said Gen. Stevenson, "for greater defense in depth, not only for warning, but for identification, interception, and destruction."

Placing further responsibility on the shoulders of industry, the military leader said, "In conclusion, I would leave one thought with you. You, as telephone men, as leaders providing the technical know-how in a free enterprise economy, represent one of our greatest bulwarks against world communism.

"One way—mind you, I said one way —we must resist communism is in the area of force. We must, at all times, maintain such a deterrent capability that an aggressor will be unwilling to assume that risk. Air defense of the western hemisphere plays an important part in such a capability.

"We do have an air defense system," assured the Air Force Commander, and "it is becoming as scientific and modern as our industrial technology will allow."

CITA directors for 1961-62 are as follows: Harlan W. Holmwood, General Telephone Co. of California; J. P. Maguire, Central California Telephone Co.; Peter A. Nenzel, California Water & Telephone Co.; J. Curtis Newman, Coachella Valley Telephone Co.; W. Gilman Snyder, The Western Telephone Co.; Allan R. Stacey, Sunland-Tujunga Telephone Co.; and Donald H. Strahl, Gilroy Telephone Co.

The directors elected as their officers: President, Mr. Holmwood; first vice president, Mr. Snyder; second vice president, Mr. Stacey; and Neal C. Hasbrook, secretary-treasurer.

Traffic panelists answer a series of questions posed by the audience during the panel meeting. Panel members include (from left to right): H. R. Woodburn, California-Oregon Telephone Co.; William Dales, California Interstate Telephone Co.; D. A. Perigo, chairman, West Coast Telephone Co.; and Mrs. Lois Dutro, California Water & Telephone Co.

THE Plant Man's Notebook

BY RAY BLAIN, TECHNICAL EDITORIAL DIRECTOR

THE UNLISTED telephone number fad is sweeping the country. In Greater Miami, Fla., it is reported that 39,000 subscribers out of 300,000 have unlisted numbers.

When you have an unlisted number, your identity is safer with the telephone company than with the FBI. If you are downtown and want to call home and have forgotten your telephone number, you are just out of luck. This number is available to long distance operators only.

The question is: Why should so many people have a need for an unlisted telephone? Why have a telephone if no one except a favored few can call you?

We understand that one large company charges 50 cents per month for an unlisted number. Since this charge was placed in effect, the unlisted numbers have decreased some 25,000 for this particular company.

In this connection, however, there are numerous legitimate reasons for having an unlisted number. Doctors frequently have an unlisted telephone in their home in order to avoid excessive calls at night. Moreover, people who have a name the same as a famous person such as Harry Truman or Marilyn Monroe, or an unusual name such as Theodore Bear, have a real need for an unlisted number. Slightly inebriated persons take a fiendish delight in calling the telephone number of such people at all hours of the night.

Undoubtedly others resort to the unlisted number in order to avoid everyday nuisance calls. Residence telephones are called all day and late into the evening by solicitors trying to sell magazines, rugs, furniture, cemetery lots, etc. This can become a terrible nuisance in some communities.

Then, people with common names such as Smith will receive calls from people inquiring if this is Joe Smith that they knew while in the Army—or Charlie Smith the plumber.

These may all be some of the reasons why the unlisted telephone is gaining in popularity.

•

A new 2,500-airline-mile communications system has been inaugurated by the state government of West Virginia, connecting the state capital buildings directly with 23 cities throughout the state.

This system consists of 28 interconnected private talking circuits, an expansion of the state police private teletypewriter network from 6 to 18 points, and three centrally-located teletypewriter exchange service installations.

•

Ice can't form on a radio beam.

You can be sure that the men in charge of Rochester (N. Y.) Telephone Corp.'s systems remembered this during the severe sleet storms of last winter. Over a hundred channels of microwave carried the extra load without a single call being lost.

Systems of this type not only provide trunk circuits impervious to ice and falling limbs, but also provide possibilities for back-hauling that make alternate routes available in case of an "outage" in short-haul physical circuits.

Particularly in Brockport, N. Y., 25 miles west of Rochester, the sleet storms caused a total power blackout that had the town nearly prostrate. The microwave channels formed the vital link to the outside and aided immeasurably in the establishment of emergency procedures.

The microwave routes leading south and west of Rochester also fulfilled the same function—100 per cent service for the duration of the storms.

•

The Pacific Telephone & Telegraph Co. has stated that all number calling (ANC) is a necessity. It is allied to a tremendous population growth.

ANC is, however, a long-range program with this company. In California, it will be introduced in smaller towns and cities on a planned basis. There are no immediate plans for the elimination of prefix names in the larger metropolitan communities.

The schedule for introducing all number calling in California is confined to dial conversions and cut-overs from 4-digit to 7-digit numbering.

As new telephones are listed in the San Francisco area directories, they will appear with only the first two letters of the prefix name listed in front of the number. This is all the caller uses when dialing a number, and it can be considered a first step towards all number calling.

•

Pacific Telephone-Northwest is using the Osmoplastic treatment of poles in Oregon. This is a black, sticky chemical solution that is swabbed around the pole at the ground level, and down about eighteen inches. It effectively kills all fungi.

The plant crews of this company, and those of contractors, have given the Osmoplastic treatment to nearly 50 thousand poles in Oregon during the past nine years. A pole has to be 12 years old to qualify for rejuvenation. This treatment proves a good investment as it extends the life of poles considerably. It costs about twice as much today to place a pole in plant as it did 20 years ago.

•

According to a psychiatrist, relatively few accidents are wholly accidental. Those attributed to pure chance are below 15 per cent.

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It is claimed that a man doesn't begin to improve himself until he becomes dissatisfied with the way he is.

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It is claimed that behind every successful man you will find a woman who thinks she has nothing to wear.

***AE** offers*
a complete package for your dial

Changes, changes, changes! That's what happens when you convert to dial. Your central office equipment must be changed. New phones must be installed. Your outside plant may require replacement. But, the results are worth it...

If your changes are made properly, you provide better service and boost your revenue. Dealing with AE is mighty good assurance of getting things done the right way from start to finish. That's because we offer *a complete package* designed to meet *all* your conversion needs.

Are you planning a dial conversion? Then get in touch with us. We've helped hundreds of telephone companies to solve their dial conversion problems. We'd like to do the same for you. Just write Automatic Electric Sales Corporation, Northlake, Illinois. In Canada, Automatic Electric Sales (Canada) Ltd., 185 Bartley Drive, Toronto 16.

AUTOMATIC ELECTRIC GENERAL SYSTEM

Subsidiary of

GENERAL TELEPHONE & ELECTRONICS

conversion

1 **Modern dial phones.** AE has a complete line of instruments to meet the needs of any residential or business subscriber in your area.

2 **Strowger Automatic** dial switching equipment. The simple design of this famous equipment insures minimum maintenance. Provision is made for many modern features which you may want to offer in the future. And, Strowger is easy to expand for later growth.

3 **Dial paystations** in a choice of 10 colors. The color attracts attention. And, with dial service, it's easier to make paystation calls. Result: You increase revenue from people on the move.

4 **P-A-B-X systems.** When you convert an exchange, your PBX subscribers will want to change to dial. AE offers you stock delivery on six P-A-B-X models. And, there's a choice of 16 auxiliary services to meet special needs of your customers.

5 **Transmission facilities.** AE offers facilities and equipment for all transmission needs—open wire, cable, microwave and carrier.

6 **Automatic Toll Ticketing.** The simple circuits and unitized construction of Strowger equipment permit it to be adapted quickly and economically to provide automatic toll ticketing. And, Strowger equipment works directly into accounting machines, without converters.

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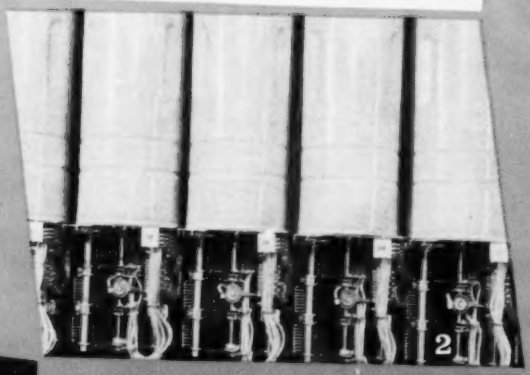
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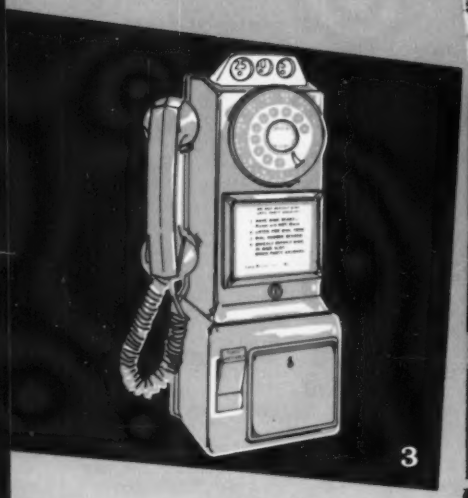
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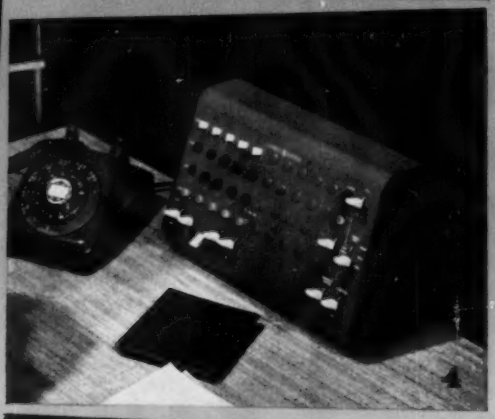
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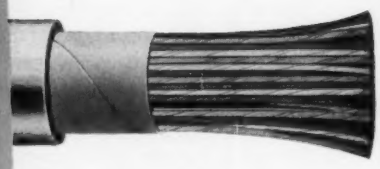
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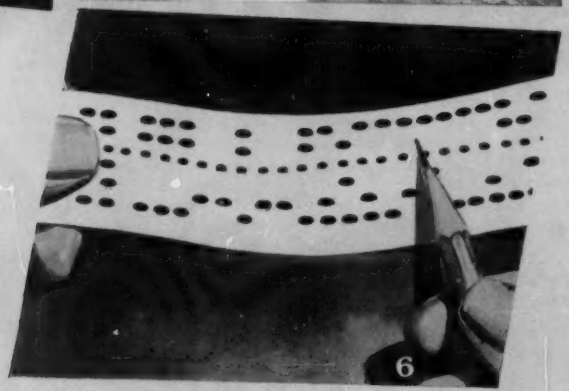
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THE Operator's Corner

By MAYME WORKMAN — TRAFFIC EDITOR

NOW THAT SUMMER has arrived, and graduation time has come and gone, many youngsters will be drawing their first pay check. They will either appreciate the money they have earned, or take it for granted. From the very beginning, it is essential that young people learn a few basic principles of handling money. Only then will they fully appreciate that precious salary.

Every girl loves the thrill of spending her own money. Clothes, cosmetics, books, theatre tickets, vacation trips—the list is endless.

Everyone must learn the art of making their money do the basic jobs while still leaving themselves enough for fun and frolic. If you don't want to wind up the month with real financial headaches, or the need to borrow from parents, older sister, or best friend (none of which is recommended as an aid to independence), you must face the financial facts of life quickly and realistically.

There's only one sure way to find out what your expenses are going to be. Keep track of them accurately and faithfully for at least a month, watching the pennies along with the dollars. If you get started on the right track, you will usually have a little extra cash for bowling parties, new books, week-end trips, etc.

The following are some of the essential items every working miss must pay:

Rent. Even if you are living at home, work out some fair agreement with your parents to cover your room and meals at home. This will be excellent training for the time when you may decide to rent your own apartment or get married. If you share an apartment with several other girls, you must be prepared to assume your full portion of the rent, telephone, electric, gas and food bills.

Transportation. Whether you get to work by family car, bus, subway, or train, figure out the minimum cost—and then allow for a few days of late starts or bad weather when a cab is an essential luxury. Walking part way or all the way to work, if the distance is not too great, is fine for the figure and the budget.

Lunch money. Many telephone folk are fortunate in having company cafeterias where they can purchase inexpensive lunches. Others bring their lunch from home. Some like to go out for an occasional luncheon splurge with friends or co-workers. Others go home for lunch.

Office gifts. To avoid hard feelings and to provide for the same treatment to each employe, some offices organize clubs which any employe can join. They collect 25 cents from each person and always have enough for a gift. This set-up enables each employe to know how to budget for this item.

Clothes. This is the pitfall most girls must watch out for carefully, for with all the lovely clothes on the market, there is the temptation of over-indulgence. Unwise spending on clothes may result in financial difficulties or in economizing on food, which can lead to a health problem.

Take the time to make a thorough survey of your present wardrobe. List all the items you need to put it into first-class operating condition. Plan your color scheme with careful attention to harmonizing suits, coats, blouses, dresses and accessories. Then, shop with a professional and critical eye, resisting those things that look priceless in the store—and worthless in your wardrobe.

Cosmetics. A different lipstick and nail polish for every outfit sound wonderful in the slick fashion pages, but you'd do well to choose several becoming shades of each, and stick to them.

Charge accounts. Don't let the advertising blurbs deceive you. Your credit is only as good as your regularity in meeting those bills. Unless you are sure you can meet them, better stick to cash-and-carry until you get your regular expenses in the groove.

Hospitalization and insurance. These should be included in every budget. They are indispensable. Many companies offer hospitalization plans to employes and some also make life insurance policies available. You can't find a better or more economical way to buy either.

Savings. Begin a regular savings plan as soon as you begin to work. You will always be glad you did.

Christmas and vacation clubs. This is an excellent way to save money for gifts and fun.

Some Additional Hints for Pay-Check Appreciation

(1) Try the envelope system for dividing your weekly stipend into daily allotments for special purposes. Label each one according to its assignment.
(2) Save dimes, quarters, or half dollars in a coin bank—and deposit them in your savings account.
(3) Take advantage of subscription rates on your favorite magazines for a big annual saving.
(4) Plan your major purchases so they do not all come due at once.
(5) Remember that better quality means less frequent replacements; saves in the long run.
(6) Buy three to six pairs of hose in the same color—preferably at the same time—for odd-stocking match-ups.
(7) Purchase your favorite cosmetics, soaps, lingerie, etc., during the big semi-annual sales.
(8) Have a private signal that flashes "think budget" when temptation looms.
(9) Don't brood or give up if you fall short of your savings goals once in a while. That's what makes high "finance" so fascinating.

Managing your pay check can be fun, and saving on a purchase can be thrilling when you realize that you have saved enough on several items to add to your "fun budget."

(Continued on page 56)

Courts and Commissions

Metropolitan Plan OK'd for SW Bell in Kansas, Missouri

The Kansas City metropolitan service plan, proposed last year by the Southwestern Bell Telephone Co., received the approval of the Kansas Corporation Commission, on June 29, and was to be put in effect in Kansas on July 1 (TELEPHONY, Aug. 22, 1959).

This streamlined service will greatly enlarge the nontoll scope for most of the 80,000 telephone subscribers in Kansas City, Kan., and in suburban communities such as Bonner Springs, Olathe and Stanley.

Increases for the center zone, servicing Kansas City, Kan., and for the adjoining Melrose and Bethel zones, are as follows:

	Old	*New*
One-party residence	$ 6.25	$ 6.75
Two-party residence	4.75	5.00
Four-party residence	3.75	3.80
Business	15.50	17.00

The option in the outer zone is for only one-party lines. Instead of the $5.65 new rate for local zone, they can have a residence service at $10.75 which permits free calls to the center zone. The business rate would be $21.

The metropolitan plan has been approved in Missouri, but because of the technical work to be accomplished, it is reported, Kansas City (Mo.) and its environs will not be given the enlarged scope until fall.

Karl A. Reuter, district manager in Kansas City, Kan., estimated the new plan ultimately will make toll free more than 7 million of the 9 million interzone calls made annually in the Greater Kansas City area.

Fulfillment of the plan required more than three years of study and an expenditure of more than 2 million dollars, Mr. Reuter said.

Under the plan for Kansas customers, three types of zones have been established, Mr. Reuter explained. The primary one is the center zone, which includes Kansas City, Kan. It is surrounded by first-tier zones of Bethel and Melrose.

Further out from the center zone are second-tier zones including Olathe, Bonner Springs, Stanley-Stilwell and other suburban communities.

The metropolitan plan, when completely adopted in Missouri, will serve telephone users in all of Greater Kansas City.

The metropolitan service plan will work as follows:

Telephone users in the center zone will be able to call each other, and all telephones in first-tier zones, as part of their regular service. They also will be able to call free any customers in second-tier zones having optional extended service.

Deny Mich. Bell's Request For Rate Rehearing

The Michigan Public Service Commission, it was reported on July 12, unanimously rejected an application by Michigan Bell Telephone Co. for a rehearing of the commission's February rate order granting the company a $4,140,000 increase (TELEPHONY, Apr. 16).

The commission also rejected an application for a rehearing sought by the Michigan Utility Rate Payers Association, which wanted to scale down the company's rates.

The Bell company originally sought increases of up to 25 million dollars a year, based on the company's request for an 8 per cent return on its investment.

The commission granted the company an additional $4,140,000 in mid-February in a decision based on a rate of return of 6.62 per cent.

Two Kansas Companies Get OK To Serve 3 Exchanges

Two telephone companies in eastern Kansas have been authorized to take over three exchanges, it was reported on July 17.

The Kansas Corporation Commission told Craw-Kan Cooperative Telephone Association, Girard, it could serve the exchanges at Galesburg and Urbana and the Northern Kansas Telephone Co., Ottawa, it could serve Earlton.

At the same time, the local companies, Galesburg Rural Telephone Association, Urbana Telephone Co., and the Earlton Mutual Telephone Exchange, were allowed to cease business.

Approve Interim Raise For New York Company

The New York Public Service Commission has accepted a tariff amendment filed by the Williamstown Telephone Co. to establish a higher rate schedule, effective until conversion to dial operation, which is set for November.

The new rates, effective July 15, are expected to produce about $160 additional monthly revenue during the interim period. In filing the new rate schedule, the company said it proposed to establish an entirely new tariff later to be applicable to dial service.

The Williamstown company serves about 200 subscribers. It reported a net operating loss of almost $9,000 for 1959.

Under the new interim tariff, the rates will be as follows:

One-party residence	$4.75
Five and ten-party residence	3.50
Multi-party rural residence	3.00
One-party business	6.75
Five and ten-party business	5.00
Multi-party rural business	4.50

Two Tex. Increases Granted For General of Southwest

Rates increases have become effective for two Texas exchanges of the General Telephone Co. of the Southwest, San Angelo. Old and new rates are shown as follows:

Blooming Grove, Dial, 324 stations, June 1.	*Old*	*New*
One-party business	$9.50	$11.00
Two-party business	7.50	8.75
One-party residence	4.75	5.50
Two-party residence	4.00	4.75
Daingerfield, Conversion to dial, 1,429 stations, June 19.		
One-party business	10.00	12.00
Two-party business	8.50	10.00
One-party residence	5.00	6.00
Two-party residence	4.25	5.00
Four-party residence	3.75	4.25

OK Transfer in Nebraska

The transfer of properties, franchises and exchanges from the Benkel-

man Telephone Co., a sole proprietorship, owned by J. H. Raile, to the Benkelman Telephone Co., Inc., was granted by the Nebraska Railway Commission, effective July 1 (TELEPHONY, July 2).

File Request For $289,886 Rate Increase in Ohio

The Mt. Vernon Telephone Corp. has filed a petition with the Ohio Public Utilities Commission, it was reported on July 1, asking for a $289,886.13 rate increase.

The company says this amount would give it a 6.05 per cent rate of return on its $5,972,124.72 rate base. Present revenues of $1,050,258.57, reported for 1959, give the company a 3.79 per cent return, Mr. Vernon states.

Rates were last increased in 1955. Since that time, the company says, subscribers have increased from 12,643 to 14,868.

During that period, Mt. Vernon reports it has spent $1,396,540.74 for new plant. Also the cost of operation has increased, it states.

Present and proposed rates for the Mt. Vernon exchange are as follows:

	Present	*Proposed*
One-party business	$10.00	$13.75
Two-party business	8.75	11.50
One-party residence	5.25	7.50
Five-party residence	4.00	5.75
Rural residence	3.25	4.75

Although present rates are less than those at Mt. Vernon, the company has asked that new rates for Fredericktown, Danville, Centerburg and Gambier be the same as those proposed for Mt. Vernon.

Rate Increase Granted for Neb. Company's 6 Exchanges

The Central Nebraska Telephone Co., Blair, was authorized on June 22 by the Nebraska Railway Commission to increase rates and charges for its six exchanges as follows:

Imperial and Grant	*Old*	*New*
One-party business	$6.00	$7.00
Two-party business	5.50	6.50
Rural business	4.00	5.25
One-party residence	4.00	4.75
Two-party residence	3.50	4.00
Four-party residence	3.25	3.75
Rural residence	3.50	4.25
Sutherland		
One-party business	5.50	6.50
Two-party business	5.00	5.75
Rural business	4.00	5.25
One-party residence	3.50	4.25
Two-party residence	3.00	3.50
Four-party residence	2.50	3.25
Rural residence	3.50	4.25
Palisade (Extended Area Service to Hayes Center)		
One-party business	5.50	6.75
Two-party business	5.00	6.00
Rural business	4.00	5.25
One-party residence	3.50	4.50
Two-party residence	3.00	3.75
Four-party residence	2.50	3.50
Rural residence	3.50	4.25
Hayes Center (Extended Area Service to Palisade)		
One-party business	4.50	6.50
Two-party business	4.00	5.75
One-party residence	2.50	4.25
Two-party residence	2.00	3.50
Four-party residence	1.75	3.25
Venage		
One-party business	5.00	5.75
Two-party business	4.50	5.00
Rural business	4.00	4.75
One-party residence	3.00	3.75
Two-party residence	2.50	3.00
Four-party residence	2.00	2.75
Rural residence	3.50	3.75

The company was also given permission to increase its annual composite depreciation rate on its depreciable property from 3.75 per cent to 4 per cent.

The rate base of $582,151.71 was computed on the net book cost of the plant and equipment of $562,929.72, plus material and supplies of $10,514.77 and allowing working capital of $8,707.22.

The estimated increase of $4,073.34 in the company's net revenue will produce a rate of return of 6.79 per cent.

SW States Gets Raises At Two Texas Exchanges

The Southwestern States Telephone Co., Brownwood, Tex., has been granted an increase in local rates in the cities of Rusk and Marble Falls, it was reported on July 11.

The increases are as follows:

Marble Falls—effective June 26.	*Old*	*New*
One-party business	$8.00	$9.75
Two-party business	—	8.00
One-party residence	4.75	5.25
Two-party residence	4.00	4.50
Four-party residence	3.25	3.75
Rusk—effective Aug. 1.	*Old*	*New*
One-party business	$8.75	$9.50
Two-party business	6.75	8.00
One-party residence	4.50	5.00
Two-party residence	3.75	4.20
Four-party residence	3.00	3.45

Both exchanges are dial operated.

Marble Falls has a total of 757 stations and Rusk has a total of 554 stations.

Drop Raise Request in Ore.

The Gervais Cooperative Telephone Association has withdrawn its application before the Oregon Public Utility Commissioner for a rate increase, it was reported on June 29 (TELEPHONY, Dec. 19, 1959).

Incorporate in Nebraska

The Blackwood Telephone Co., Culbertson, Neb., has filed non-profit articles of incorporation, it was reported on July 1. Incorporators are Max A. Miller, Charles Gessleman, Joe W. Miller, Jack Wagner and Amos Wagner, all of Culbertson.

Commonwealth (O.) Company Becomes Subsidiary of GT&E

The Ohio Public Utilities Commission on July 2 approved the transfer of the assets, property and business of the Commonwealth Telephone Co., Athens, to General Telephone & Electronics Corp. Announcement of the transfer was made by Clare E. Williams, president of General Telephone Co. of Ohio and new president of the Commonwealth company.

The Athens-based company, which is now a wholly-owned subsidiary of GT&E, operates more than 16,000 stations. It is 100 per cent dial.

Ultimately, the report said, Commonwealth will be merged into General Telephone Co. of Ohio, Marion.

Officers for the Commonwealth company are as follows: H. C. Slusher, former Commonwealth president, becomes a vice president; F. W. Hamper is also a vice president; Herbert J. Vrooman is controller; T. S. Lauver is secretary-treasurer and Rolland S. Jones is assistant secretary-treasurer.

All the officers, except Mr. Slusher and Mr. Jones, hold the same positions with the General Telephone Co. of Ohio.

Named to Commonwealth's board of directors were Mr. Williams, Mr. Hamper, Mr. Vrooman, Mr. Lauver and Robert H. Henderson, who is General of Ohio's vice president in charge of revenue requirements.

Set New, EAS Rates in Ga.; Approve Expansion Loans

The Georgia Public Service Commission on June 9 approved the applications of the South Georgia Telephone Co., Sylvania, to secure an REA loan; and to set up a schedule of new rates for its Sylvania, Reidsville, Folkston, and Ludowici exchanges on completion of proposed improvements to be financed by the loan.

During the hearing, the company asked that its application be amended to include a rate provision for EAS between its Reidsville exchange and the Glennville exchange of the Sikes Telephone Co.

On establishment of this EAS arrangement, the company proposed that the same rates for Sylvania service also apply to the Reidsville exchange.

The commission, however, found it not feasible until further study to establish EAS between Reidsville, Glennville, Collins, and Cobbtown, Ga.

Also requested by the South Georgia company was the authority to set up a graded service area extending about 2 miles beyond the existing exchange base rate limits, in which one, two and four-party service only would be available to subscribers. In addition to the monthly rate, the company proposed a mileage charge for this graded service.

The commission decided that such a graded service area was "not in the public interest at this time." It also declared it no longer would give favorable consideration to flat rural rates.

It was decided jointly by the company and the commission that the problems arising from growth adjacent to the base rate area can be solved by extending the base rate area limits of its exchanges.

The commission then based its rate order on net operating revenues, after taxes, of $65,162, expected to be yielded annually on completion of the REA expansion and improvement of facilities.

The following schedule of rates was approved, effective on completion of improvements, and upon the establishment of EAS between the Reidsville exchange of the South Georgia company and the Glennville exchange of the Sikes Telephone Co.:

Business:	*Sylvania*	*Folkston, Ludowici*	*Reidsville EAS to Glennville*
One-party	$6.75	$6.25	$6.75
Two-party	5.75	5.25	5.75
Four-party	4.75	4.25	4.75
Residence:			
One-party	4.50	4.00	4.25
Two-party	3.75	3.25	3.50
Four-party	3.25	2.75	3.00
Rural multi-party service, 0-2 miles beyond the base rate area:			
Business		3.75	4.25
Residence		2.75	3.00

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On June 14, the Georgia commission also granted authority to the Pembroke Telephone Co., Inc. to negotiate an REA loan for improvements; approved the issue of 50 shares of $100 par value common stock; and set up a rate schedule to become effective on completion of the expansion program.

The company's proposal to establish graded area service for its rural subscribers was rejected at this time as not being "in the best interest of the public."

The new rates approved by the commission, to yield an estimated net revenue of $13,726, are ordered as adequate to meet the company's debts and provide a reasonable return.

Present and new rates are shown as follows:

To capitalize on summertime outdoor living, General Telephone & Electronics Corp. is using this poster to promote color telephones for outdoors in the month of July. Selected market areas in eight states were chosen for the campaign, which will run through the fall months. According to Outdoor Advertising Inc., this is the company's first use of the outdoor medium to promote the sale of color telephones.

	Old	*New*
One-party business	$6.00	$6.50
Two-party business	5.00	5.50
Four-party business	4.00	4.50
One-party residence	4.00	4.25
Two-party residence	3.50	3.75
Four-party residence	3.00	3.25

Rural multi-party rates remain as proposed by the Pembroke company, as does also the mileage charge therefor. Rates and conditions follow:

Rural multi-party (0-2 miles beyond base rate area):	
Business	$4.00
Residence	3.00
For each additional 2 miles or fraction thereof beyond 2 miles from the base rate area:	
Business and residence	0.25
Mileage charge on urban service extended to the rural area (Per ¼ mile or fraction thereof beyond the base rate area):	
Business and residence:	
One-party	0.40
Two-party	0.20
Four-party	0.10

•

The Sikes Telephone Co., Glennville, was given authority by the Georgia commission on June 30 to borrow from the REA for expansion; and a schedule of new rates was approved, effective on completion of the improvements.

The company proposed to establish extended area service between the Reidsville exchange of the South Georgia company and its Glennville exchange. The commission, however, decided to set up an investigation to determine the adequacy of toll facilities through the Claxton toll center (operated by Southern Bell Telephone & Telegraph Co.), and to look into both the quality of local and toll service before taking any action on this part of the Sikes company's request.

The company also proposed to establish a "graded service area" for its rural subscribers to which the commission, after voicing objection, acquiesced. It asked the company to meet all demands of rural subscribers for graded service.

The commission again stated, as in its June 9 order for the South Georgia company, and in the June 14 order for the Pembroke company, its opposition to any company proposals for establishing a flat rate in rural service areas.

The commission approved rates to yield annual net revenues of $25,297, to enable the company to meet its loan obligation and to provide a reasonable return on capital investment.

The following schedule shows old and new, approved rates:

	Old	*New*
One-party business	$6.25	$6.75
Two-party business	5.25	5.75
Four-party business	4.25	4.75
One-party residence	4.00	4.25
Two-party residence	3.25	3.50
Four-party residence	2.75	3.00
Multi-party rural, flat rate:		
Business	5.25	5.25
Residence	4.25	4.25

Mileage charge on urban service extended to the rural area. Per ¼ mile or fraction thereof beyond the base rate area. (Business and residence):

	Proposed	*Approved*
One-party	$0.40	$0.40
Two-party	0.20	0.20
Four-party	0.10	0.10

Grant Interim Rate Raise To Alabama Company

The Jackson County Telephone Co., Scottsboro, on July 2 was granted an interim rate increase by the Alabama Public Service Commission.

In its order, the commission requires

(Continued on page 46)

MORE CIRCUITS PER CABLE.
Anaconda High-Count cable contains up to 2727 pairs. More pairs mean maximum utility of existing ducts.

Now get more circuits in new and existing ducts with ANACONDA® High-Count cable

Up to 2727 pairs per cable—that's how Anaconda's HC cable makes possible much more efficient use of your duct banks. In many cases, no new ducts are needed—no new construction to pay for. Your existing duct system can hold more circuits, serve more subscribers and bring in more revenue with Anaconda High-Count cable.

The chart below sums up the basic facts on all types of Anaconda HC cable. For more specific information on any one type, write to Anaconda Wire and Cable Co., 25 Broadway, New York 4, New York. 60247

PHONE THE MAN FROM
ANACONDA®
FOR TELEPHONE CABLE
the independent manufacturer for the independent telephone industry

HIGH-COUNT CABLE

STALPETH

Conductor Size	Number of Pairs	Guaranteed Number of Pairs	Approximate Overall Diameter	Approximate Net Weight	Shipping Weight	Standard Reel Length
			inches	lb per M ft	lb per M ft	feet
19	556	556	2.97	5950	8430	700
22	1111	1111	2.96	5940	8400	700
24	1818	1815	2.96	6060	8530	700
26	2424	2418	2.89	5270	7750	700
26	2727	2721	3.04	5990	8470	700

PAPER-LEAD

Conductor Size	Number of Pairs	Guaranteed Number of Pairs	Approximate Overall Diameter	Approximate Net Weight	Shipping Weight	Standard Reel Length
			inches	lb per M ft	lb per M ft	feet
19	556	556	2.86	10,370	12,850	700
22	1111	1111	2.87	10,410	12,900	700
24	1818	1815	2.85	10,320	12,800	700
26	2424	2418	2.78	9,520	12,000	700
26	2727	2721	2.94	10,550	12,920	700

the company to convert its Scottsboro exchange to dial on or about Jan. 1, 1962.

The company, which also has an exchange at Section, was granted "only such increase in rates as was considered necessary to pay all proper expenses and provide a minimum return on the company's present manual type equipment."

North-west Telephone To Merge with B. C. Company

British Columbia Telephone Co. common stock shareholders at a special general meeting in Vancouver on July 14 approved a proposal for the merger of North-west Telephone Co. with British Columbia Telephone Co.

North-west is a wholly-owned subsidiary of Anglo-Canadian Telephone Co., a Quebec corporation, which has a substantial interest in British Columbia Telephone Co.

Preliminary steps for the acquisition of North-west by British Columbia Telephone, including changes in legislation affecting both companies, were taken earlier this year.

Under the terms of the merger, the British Columbia company will acquire 900,000 common shares of North-west in exchange for 144,000 common shares of British Columbia Telephone Co., and then transfer the assets and properties of North-west to British Columbia Telephone.

In addition to the 900,000 common shares, North-west has outstanding 100,000 5 per cent cumulative redeemable preferred shares of a par value of $10 each and $1,500,000 principal amount of first mortgage bonds. Both of these are to be called for redemption and paid off prior to the transfer of assets.

The merger will require the approval of the Canadian Board of Transport Commissioners and the British Columbia Public Utilities Commission. The former was scheduled to hear British Columbia Telephone Co.'s application for merger with North-west in Ottawa on July 19.

North-west provides local and long distance telephone service in Powell River and Ocean Falls on the mainland; in Campbell River and other communities on northern Vancouver Island, and in the Queen Charlottes.

It also serves Prince George and the Peace River area of British Columbia, including Dawson Creek, Fort St. John and Pouce Coupe. In the northwestern part of the province, the company provides local service at Atlin and Stewart and radio communication to Telegraph Creek.

All Vermont Subscribers To be Queried on Service

Telephone subscribers of all Vermont companies will be asked their opinions about service in a survey being undertaken by the Vermont Public Service Commission.

Commission Chairman Charles R. Ross said that questionnaires will be sent out to subscribers of the Southern Vermont Telephone Co., Bridgewater, and the Rutland County Telephone & Telegraph Co., Wallingford, in the first phase. Eventually, subscribers of all other Vermont companies will be queried.

Among questions asked are whether subscribers consider rates excessive and whether they find the quality of connections good.

Chairman Ross said the survey was prompted by a "general dissatisfaction" with telephone service in the state.

N. Y., Ia. Independents Negotiate Private Loans

The Oswego County Telephone Corp., Fulton, N. Y., and the Farmers Mutual Telephone Co., Clarinda, Ia., it was reported on July 14, have obtained 25-year first mortgage loans, respectively for $500,000 and for $150,000. The Oswego County company's loan is with the Berkshire Life Insurance Co. and the Connecticut General Life Insurance Co. The Farmers Mutual's loan is with the Berkshire Life company.

In both instances, the Independents plan to use loan proceeds for refunding bank notes and for expansion. The Berkshire company has twice made loans to each of these companies.

Challenges Missed

"I think we have made two grievous mistakes with our young. We told them half-truths which were in effect false ones. We told our sons for example, that this country was carved out of the wilderness.

"This country was not carved out of the wilderness. This country was hammered and scratched, and dug and clawed out of the wilderness by bare-handed men who asked nothing for nothing.

"We told our young people what a wonderful thing it is to be an American. But we forgot to tell them what a difficult and a demanding and a dangerous thing it is to be a free American and to have to make decisions for yourself.

"What a magnificent challenge we could have provided—but instead of that we promised them security from the cradle to the grave."—Paul Harvey, American Broadcasting Co. news commentator, in a talk before the Wisconsin State Telephone Association Convention.

It Takes Lot of Facilities For GOP Communications

A team of 200 telephone specialists of Illinois Bell Telephone Co. installed and prepared communications facilities for the Republican National Convention, being held in Chicago this week.

Forty microwave "dishes" which beam the televised picture of the convention to a coast-to-coast audience have been installed on a special platform atop the roof of the International Amphitheatre.

Two hundred fifty teletypewriters are available for the use of newspapers, news agencies and broadcasters to keep the world abreast of the convention. Some of the machines are earmarked for the Soviet Tass News Agency and for two Japanese newspapers.

Underground cables have been placed from four separate Illinois Bell central offices to the Amphitheatre to handle the estimated 25,000 calls flowing in and out of the Amphitheatre daily during the convention over the 3,500 telephones which have been installed for the convention.

An estimated 12,000 miles of telephone wire link the convention telephones with existing Bell System equipment.

Illinois Bell maintains a Telephone Message Center, as a clearing house for the bulk of calls to convention delegates. Delegates and other visitors to the convention are able to receive messages and place long distance calls through the center with the help of telephone girls clad in tailored red suits.

A special emergency fleet of Illinois Bell vehicles are on duty in another part of the area where news or special events break. These include a 32-foot mobile telephone center, TV trucks and 75-foot "snorkle" for radio relay transmission.

Suspend Rate Increase For Oregon Company

A rate increase, asked on June 15, by the Lincoln-Tillamook Telephone Co., Oceanlake, to be effective on July 15 for its exchanges, was on July 12 suspended for six months by Oregon Public Utility Commissioner Jonel C. Hill, pending investigation.

GET ON THE ALTEC LINE—for improved telephone equipment

The best number in your book—the one that connects you with the Altec line. For performance, reliability, and servicing ease, the Altec line of amplifiers and equipment have won a resounding vote of confidence from the industry. Precision-engineered to meet your most exacting specifications. All items available from current stock. Deal directly for greater efficiency with your Altec factory representative!

The 455A Amplifier is a transistorized repeater type amplifier wrapping up a compact package of gain for telephone circuit use. Incorporates the gain, power handling capacity, frequency response, plug-in features in the physical size of vacuum tube type repeater. Ten repeaters go in the same standard rack mount used for vacuum tube types. Operates on 48 volt DC @ 22 ma. Since it is transistorized no 130 volt supply is needed. For details, write for Altec Lansing Bulletin #13385.

The 529A Power Supply, designed for standard rack mounting, occupies only 3½" of panel space. Operates from 117 volt, 50/60 cycle AC line and delivers 20 volts DC at 3 amps., (0.3 amp at each of ten separate outlets). Maximum ripple content is below 0.002 volts at operating voltage, insuring extremely low noise and high efficiency amplifier operation. Each power outlet is individually fused with a 3/10 amp. fuse. DC voltmeter and rotary selector switch to check each distribution outlet are incorporated on front panel. Variable resistor located on panel front permits adjustment of output voltage to suit load conditions. The 529A can be used with Altec Transistorized Repeaters 477A, 449A, 450A and 453A. Write for Bulletin #13224.

For complete information about Altec telephone and paging equipment write to the address below or call PRospect 4-2900 in Anaheim or ALgonquin 5-3636 in New York.

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by Ellsworth Nichols

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Published by Public Utilities Reports, Inc. and kept up-to-date by periodic pocket supplements.

One of the most important subjects, if not the *most important subject*, constantly confronting utility managements, regulatory commissions and others concerned, is the *amount of return* to be *allowed public utility companies* and *how best* to *determine that return.* After almost four years of research, study, and analysis, Ellsworth Nichols, Editor of PUBLIC UTILITIES REPORTS and author of other publications on regulation, has completed his new volume *"RATE OF RETURN."*

Throughout the work, emphasis is placed on the *ruling principles of courts and commissions* concerning the *various factors to be considered, the weight to be accorded such factors,* and *illustrations* of the *application* of the *principles discussed.*

The volume contains 25 chapters, each dealing with an important phase of the subject.

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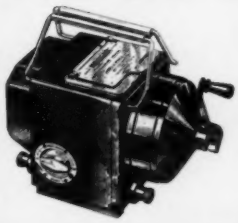

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The performance and endurance records of Megger Instruments are difficult, if not impossible, to match in any type of portable testing device. Sizes range from Midget Megger tool-kit instruments with ratings up to 100 megohms, 500 volts d.c. to Heavy Duty Megger Insulation Testers with special ranges to 200,000 megohms, 10,000 volts d.c. The Meg Type of Megger Insulation Testers (illustrated) in ranges up to 2000 megohms, 1000 volts d.c. are available in hand-crank, rectifier-operated or dual-operated models.

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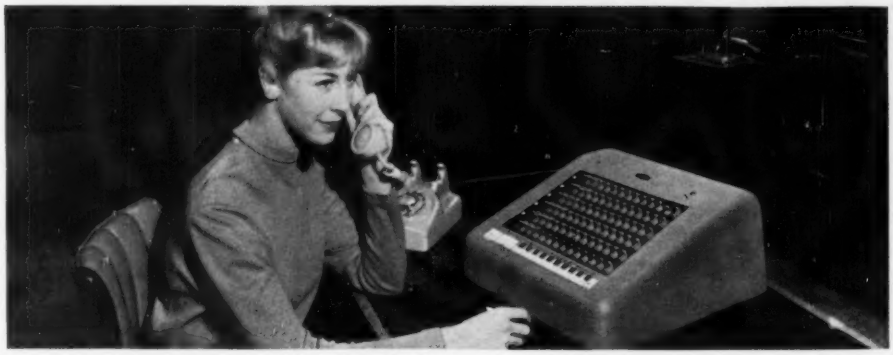
CORDLESS PBX



Years-ahead styling makes the Leich PBX a switchboard that sells itself. An amazingly simple keyboard lets an operator handle calls faster and easier than any PBX you've ever seen. And Leich's Cordless gives your subscribers all the service features that they desire most.

On top of these big improvements, you have a PBX switchboard unsurpassed for dependability. Thanks to a simplified arrangement of working parts, costly service calls are kept to an absolute minimum with Leich's Cordless PBX. Improved one-way keys assure dependable service. Here is the switchboard that sells itself — in style, in features, in dependability.

You can offer subscribers excellent delivery because these Leich PBX's are available from stock.

modern, compact, easy to operate

A new approach to styling—neat lines, neutral gray finish, small compact cabinet! What more could subscribers want than this 16½" x 16" x 7½" beauty with all the features of larger, more cumbersome boards. The Leich PBX fits easily on the desk and leaves ample room for other work.

But the key to its sales appeal is a simplicity of operation that makes any office girl a switchboard operator. The ingenious key arrangement makes it simpler to handle all the functions of the board. Visibility of keys is better—even numbered station line keys are beige, odd are black, and trunks are gray.

Each key operates in one position only, eliminating confusion and reducing the chances for error. All of this makes the Leich PBX a real good deal for subscribers—it sells itself.

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R. H. Fischer Receives LT&T Woods Award

Richard H. Fischer, Pawnee City, Neb. manager for the Lincoln Telephone & Telegraph Co., received the Frank H. Woods certificate of merit and a cash award of $25 on July 8 in recognition of an "act of extraordinary service that was not a part of assigned duties." President Thomas C. Woods Jr. made the presentation.

On Dec. 3, 1959, Mr. Fischer heard sounds suggesting a person in severe pain when he tested the line of 80-year-old Miss Stella Stewart, to investigate a possibly uncradled receiver.

While cashier, Mrs. Avis Collar, tried to converse with Miss Stewart, Mr. Fischer went to the Stewart residence where he heard cries of pain from the inside.

He forced open the back door and found Miss Stewart near the telephone in a state of shock. She had broken her hip in a fall at 6:30 a.m., and it had taken her until 9:00 a.m. to crawl from the kitchen to the telephone in the living room.

Fischer wrapped her in blankets and called an ambulance and a doctor. Hospital officials and doctors indicate that Mr. Fischer's prompt action at the time saved the life of Miss Stewart. Miss Stewart, however, died on Jan. 19 of a heart attack.

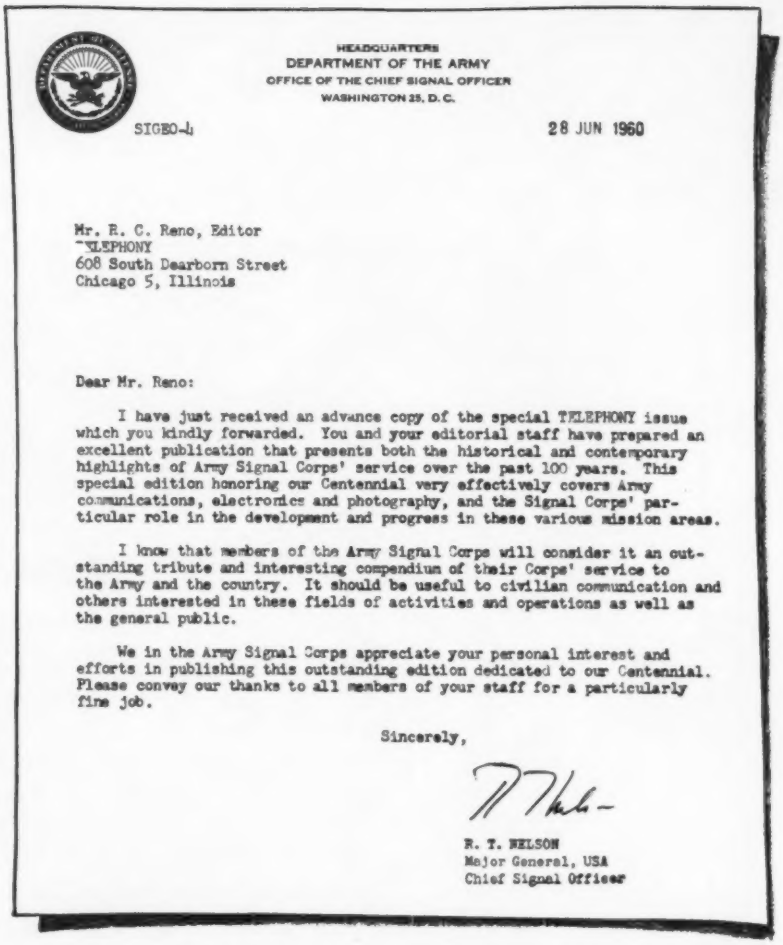
Two PT&T Employes in Wash. Get Vail Heroism Medals

Two Spokane, Wash., employes of the Pacific Telephone & Telegraph Co., Don Potts and Bill Sage, who are installers, have recently received silver Vail awards for heroism in the first Washington presentations by the company.

Silver Vail medals, $1,000 checks and American Red Cross Certificates of Merit were awarded the men for their heroic and courageous action at "great personal risk."

Last January, Mr. Potts and Mr. Sage noticed a power line burning on the ground at Geiger Field, Spokane. They parked their car to block the street near the wire, and with the use of rubber gloves and a wire-raiser, lifted the wire off two linemen who were lying on the ground. Mr. Sage immediately started artificial respiration on the victim who seemed to have the better survival chance.

The men also directed spectators away from an energized truck, averting other possible accidents. They continued their efforts to revive the victims until a doctor pronounced them dead.



HEADQUARTERS
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF SIGNAL OFFICER
WASHINGTON 25, D. C.

SIGEO-4 28 JUN 1960

Mr. R. C. Reno, Editor
TELEPHONY
608 South Dearborn Street
Chicago 5, Illinois

Dear Mr. Reno:

I have just received an advance copy of the special TELEPHONY issue which you kindly forwarded. You and your editorial staff have prepared an excellent publication that presents both the historical and contemporary highlights of Army Signal Corps' service over the past 100 years. This special edition honoring our Centennial very effectively covers Army communications, electronics and photography, and the Signal Corps' particular role in the development and progress in these various mission areas.

I know that members of the Army Signal Corps will consider it an outstanding tribute and interesting compendium of their Corps' service to the Army and the country. It should be useful to civilian communication and others interested in these fields of activities and operations as well as the general public.

We in the Army Signal Corps appreciate your personal interest and efforts in publishing this outstanding edition dedicated to our Centennial. Please convey our thanks to all members of your staff for a particularly fine job.

Sincerely,

R. T. NELSON
Major General, USA
Chief Signal Officer

Among the many letters received by TELEPHONY commending the special June 18 issue commemorating the Centennial of the U. S. Army Signal Corps, was one from Maj. Gen. R. T. Nelson, Chief Signal Officer of the Army, reproduced above. Requests for copies of the Signal Corps issue have been received from all sections of the U. S. and from Canada.

La. Law Allows Companies To Bill for Municipal Taxes

A bill to permit utility companies to pass on to local subscribers any gross receipts taxes levied by municipalities has been passed by the Louisiana legislature.

Southern Bell Telephone & Telegraph Co. and the city of New Orleans, which has a 5 per cent gross receipts tax on the company, have been involved for some time in federal court disputes about 2 per cent of this tax, levied in recent years. Revenues from this 2 per cent have been tied up during the controversy.

In 1958, the city and SBT&T reached a tentative agreement under which the company would agree to the tax if it could be passed on to subscribers.

The question was taken before the Louisiana Public Service Commission, which on Dec. 11, 1958, voted that the company could not pass these taxes on to its subscribers (TELEPHONY, Dec. 27, 1958).

Rogosch Joins Nev. Company In Commercial Post

Vern Rogosch, formerly San Fernando district commercial superintendent of the California Water & Telephone Co., Monrovia, has been named general commercial superintendent of the Southern Nevada Telephone Co., Las Vegas.

Mr. Rogosch has had 15 years experience in various telephone commercial department operations.

Frank A. Dresslar Sr., president of the Nevada company, also announced the appointment of John W. Mallory as general traffic superintendent.

Mr. Mallory joined the company Mar. 1 as traffic engineer. He was formerly with the West Coast Telephone Co., Everett, Wash.

Pontius Retiring From Ind. Company; Shultz Successor

Roscoe D. Pontius, vice president and general manager of the Rochester (Ind.) Telephone Co., will retire on Aug. 1 from his post as operating head of the company, a position he has held for 26 years. Mr. Pontius will continue as vice president and as a member of the board of directors.

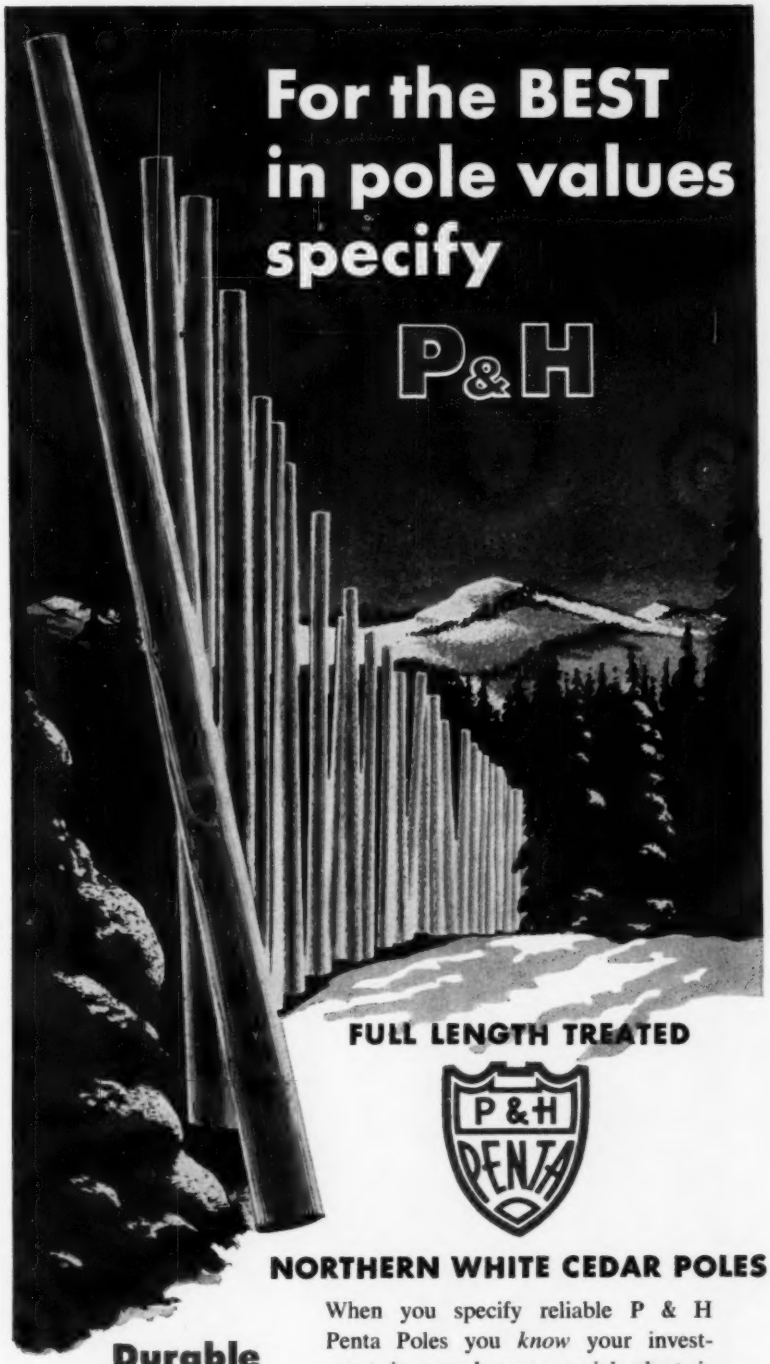
R. D. PONTIUS

James H. Shultz, division manager of the General Telephone Co. of Indiana, Richmond, will succeed Mr. Pontius. Mr. Shultz has held responsible positions in the former Northern Indiana Telephone Co. of North Manchester, and has served as general manager of the Richmond Home Telephone Co.

J. H. SCHULTZ

Having spent his entire business life, a total of 48 years with the Rochester company, Mr. Pontius has a wide acquaintance in the telephone industry.

He graduated from the Rochester high school in 1911, and began working



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as a lineman and trouble shooter. Prior to that, for two summers, he worked in the Rochester company's office.

Mr. Pontius became wire chief in 1914 and shortly afterward, assumed the duties of bookkeeper. In 1931 he was appointed office manager, and in 1934 was named general manager.

In 1959, he was elected vice president, succeeding his father, Tully Pontius.

Mr. Pontius has been active in national and state telephone associations. He served as president of the Indiana Telephone Association in 1950-51, and was a member of the board of directors from 1934 to 1958.

Mr. Shultz was employed in 1945 by the Northern Indiana Telephone Co., now a unit of the General Telephone system, as commercial representative. Three years later, he became district manager, directing 13 exchanges.

He became public relations manager of the Richmond Home Telephone Co. in 1950. Subsequently, he became commercial manager, and then, general manager of that company.

After the acquisition of the Richmond company by the General company, Mr. Schultz was appointed division manager of the southern district, composed of 30 exchanges.

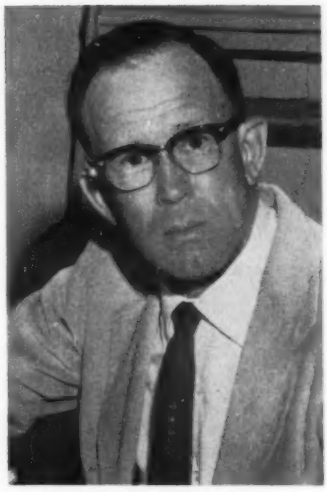
Sunland-Tujunga Announces Three Personnel Changes

The Sunland-Tujunga Telephone Co., Sunland, Cal., has recently announced three personnel changes.

William J. Ure, employed in 1947 as equipment superintendent, was named chief engineer, according to the vice president and manager, Allan R. Stacey.

Mr. Ure was born in Toronto, Can.

W. J. URE



N. H. BEACH

He attended the Lincoln (Neb.) Engineering School, and completed several night courses in electricity, drafting and electronics.

Beginning his work in the telephone industry as a station installer for the

NOEL KELLY

Bell System in 1925, he was later employed as lineman and repairman for the California Interstate Telephone Co. at Bishop; and as wire chief for the Oxnard (Cal.) Home Telephone Co.

Mr. Ure joined the Sunland-Tujunga Telephone Co. as equipment superintendent. At that time, the company was converting from manual operation to dial and automatic toll ticketing. His duties included engineering, installation and maintenance of central office equipment.

As chief engineer, he is responsible for the engineering, installation and maintenance of both outside and inside plant.

Norman H. Beach, who joined the

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Subscribers like it, too! Getting the toll tickets with the bill answers questions about forgotten calls. Saves their time as well as yours.

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company in 1949 as chief switchman, has been named equipment supervisor.

Mr. Beach was born in Pontiac, Mich., attended the local public schools, and graduated from high school in 1931.

He spent 13 years in the printing trade, working on the *Pontiac Press*, a daily newspaper.

During World War II, he was in the United States Naval Reserve, where he received his electrical training. He attended A, B and C Schools in the Navy and served as Electrician's Mate, second class (Interior Communications).

After the war, he entered the telephone business as switchman with the Associated Telephone Co., Ltd. (now General Telephone Co. of California) at West Los Angeles.

His new duties as equipment supervisor include supervision of central office installation and maintenance.

Noel Kelly, formerly a switchman, was named plant supervisor.

Mr. Kelly was born in Ottawa, Ont., Can., and attended high school there.

He graduated from Lisgar Collegiate in 1929 and began his telephone career in the same year with the Bell Telephone Co. of Canada. His work was interrupted during the depression, but he returned to Bell in 1936 as a cable splicer and installer.

He joined the R.C.A.F. in 1941 and served at Western Air Command headquarters during World War II as telephone equipment officer.

After the war he again returned to Bell and held various plant positions until 1949, when he joined California Water & Telephone Co., Monrovia.

He joined Sunland in 1952, and has held the positions of switchman, cable splicer, cable splicing foreman and engineering supervisor.

Mr. Kelly's duties as plant supervisor include supervision of outside plant construction and maintenance.

COMBAT COMMUNICATION SYSTEM

Continued from page 25

frame about 6 feet high, 5 feet wide and 6 feet deep, which holds 20 boxes, each containing one-half mile of cable. To interconnect the 20 lengths, the connectors are screwed together. The amplifiers, 10 inches long, 2 inches in diameter, as shown in *Fig. 10*, are connected between every 2 miles. The total weight of the amplifier and pigtail leads with coaxial connectors is 3 pounds.

The boxes containing the cable are stacked in two tiers, each 10 boxes high. The cable pays out of the trailing open end of each box in a sequence beginning with the top box in the left tier and ending with the bottom box in the left tier. Cardboard covers the ends to secure the connectors and amplifiers are ripped out sequentially by

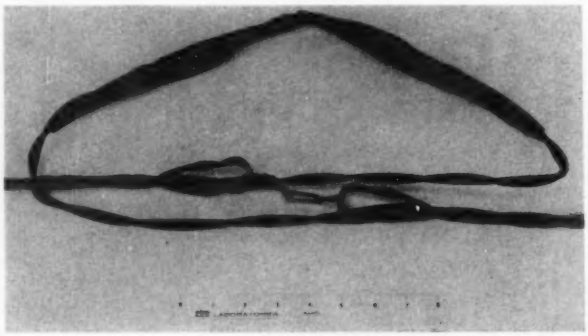

Fig. 11. Dead-end grips.

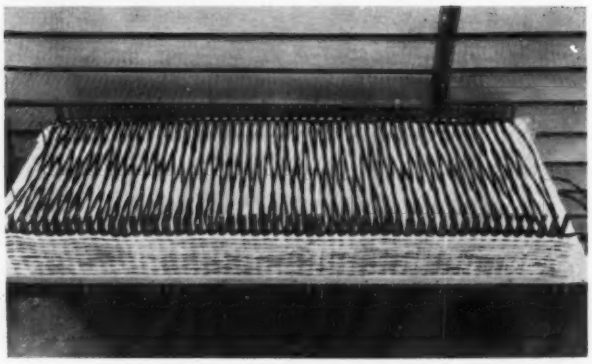

Fig. 12. Zig-zag packing.

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the cable during payout. The half-mile lengths are coupled mechanically by spiral dead-end grips and chain links as shown in *Fig. 11* so that the strain is not transmitted through the connectors.

Within each box the cable is stored in 12 layers separated by paper, each layer containing approximately 225 feet of cable traversed or zig-zagged back and forth as shown in *Fig. 12*. To secure orderly consecutive withdrawal and to prevent free fallout by the cable's own suspended weight, narrow adhesive strips of foam plastic are attached to the paper to furnish a drag against the cable. The layers are enclosed in a rigid aluminum box. This builds a module that is 5 inches high, 26 inches wide, 60 inches long, and weighs approximately 120 pounds.

The lower edge of the stabilizing fins clears the ground by 18 inches as a precaution if the package is canted by the helicopter and to permit take-off from Army XM-211 6x6 trucks with side rails. The fins may be removed and fastened over the open end of the frame for protection in shipping or storage.

Air Laying Techniques

Tactics that the Army will use with the new equipment have been developed in actual flight operations. Helicopter types H-34 (single rotor) and H-21 (double rotor) have participated. The crews had cargo carrying experience and required no special training for this work. Flight control and maneuverability of the aircraft were reported to be unaffected by the cable equipment in every case.

Other than the regulation cargo lifting gear, no special fittings are required on the helicopter for this service. The cable container is suspended from the helicopter's cargo hook and to pick it up, the helicopter hovers while the ring on the lifting cables is fastened to the cargo hook. A lanyard holding a weight attached to the end of the cable is passed into the side door to a crew member. Payout may be initiated by releasing the weight. The equipment can be set down on the ground with its full load without damage. The lifting ring disengages when the magnetically operated hook opens.

It is not necessary to orient the cable package in the direction of take-off. Two stabilizer fins on the trailing edge of the cable container turn it to the correct position to trail the cable when the forward speed reaches 30 mph.

Although this system was designed for the military, the same technique could be put to civilian use to provide emergency communication in flood or other disaster areas.

IT'S NEW!

VF VOICE FREQUENCY REPEATER

The new Budelman Type 251A Voice Frequency Repeater provides up to 20 db gain in both directions. It is very *compact* . . . four repeaters plug into a relay rack panel only 1¾ inches high. The 251A uses transistors, operates from 12, 24 or 48 volt battery and draws only 3.4 milliamps. It is *easiest to adjust*. No test equipment required. The Budelman Type 251A Voice Frequency Repeater is the *best buy* . . . only $95.25 in the U. S. Mounting shelf for four repeaters is only $19. Write now for bulletin.

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BUDELMAN bec

THE OPERATOR'S CORNER

Continued from page 40

Why not give budgeting a whirl, especially if you are just starting your work career. It will be a rewarding experience, and it may save some headaches and worries.

Your pay check is yours to spend as you choose, but take it from an old-timer who has cashed many a pay check, how you spend it will bring either contentment or worry. It's up to you.

Traffic Questions

(1) How should the information operator proceed when it is necessary to obtain the details or spelling on a call?

(2) If an order is not understood, how should the information operator proceed?

(3) When an information operator receives definite or complete details from a subscriber, is there any limitation on the extent of search?

(4) If the name is one having different recognized or probable spellings, should the information operator ask the customer how the name is spelled?

(5) If a subscriber expresses doubt as to the spelling of a name, how should the information operator proceed?

Answers to questions are on page 59.

IN THE NATION'S CAPITAL

Continued from page 18

this year. A launching is planned for later in 1960. Nonetheless, a great deal has already been learned from the Echo experiment.

The testimony of James B. Fisk showed that the opening up of electrical communication with the 94 per cent of mankind who live overseas, together with the exploration and exploitation of space, will be possible only if broad bands of frequencies above 1,000 megacycles and, roughly, below 20,000 megacycles are available for such use. Powerful transmitters and highly sensitive receivers will be necessary for space communications. These will have to operate beyond the horizon from other radio devices working on the same frequencies. Another witness, Brockway McMillan, showed how great this separation will be between various systems, and how serious is the problem of interference with ground microwave systems.

For satellite communication, bandwidths of thousands of megacycles will be needed to handle substantial amounts of overseas traffic. If such frequencies can be shared with other services, and this is doubtful, they can be shared only through the most rigorous international geographic and operational control.

Since the same electromagnetic spectrum is used throughout the world, and space communication presents many and difficult problems of interference, international co-ordination will be required in the allocation of frequencies for space use. International meetings to consider these problems are scheduled for New Delhi in 1962 and Geneva in 1963.

Ike Signs New Laws

While the Democrats were busy in Los Angeles nominating the Kennedy-Johnson ticket, President Eisenhower was "keeping store." He signed a number of new laws which Congress passed in a hurry to get away for the convention recess. Some of these executive actions are of interest to the telephone industry.

For example, Ike signed the long-awaited bill (S. 1886) granting legal status to television booster stations (Public Law 86-609). This action culminates more than two years of controversy over these stations which boost TV signals for residents in remote areas, mostly in the western part of the United States.

The FCC had earlier contended that such boosters were illegal under the law and that licensed operators must be present when broadcast signals were retransmitted. However, heavy pressure from Congress prevented the commission from ever putting the stations out of business. Under the new law the FCC will be required to license all stations now in operation and the commission may license new boosters if they are found to be in the public interest. Booster stations are also relieved of the requirement of having a licensed operator at the station during transmissions.

Commission Members Affected

The President also signed a bill providing that members of three regulatory agencies continue to serve after their terms expire until a successor replaces them. The agencies are the Federal Power Commission, FCC, and

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Lighter than canvas. Won't chip, peel, rot or mildew. Resistant to acids, oils, alkalies.

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Complete rain and wind protection with no light loss on dull days.

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the Securities and Exchange Commission. Such a law already provides for continuing service by outgoing members of the other regulatory boards, such as the Interstate Commerce Commission and the Civil Aeronautics Board. The new law specifies, however, that the additional service (by hold-over commissioners whose terms have expired) shall not be longer than the end of the next session of Congress which follows the expiration of the commissioners' terms.

Ike also made a couple of recess appointments, on July 13, to fill vacancies on the FCC and the FPC caused by the failure of the Senate to confirm earlier appointments before the recess of Congress. Ike gave Charles H. King, of Grosse Pointe Park, Mich., a recess appointment as a member of the FCC and to Paul A. Sweeney, of Chevy Chase, Md., an appointment to the FPC for the remainder of a term expiring June 22, 1963. Sweeney succeeds the deceased John Hussey.

The President submitted King's and Sweeney's names to Congress earlier this year. King was appointed for the unexpired term of John C. Doerfer, who has resigned. The unexpired term runs through June 30, 1961.

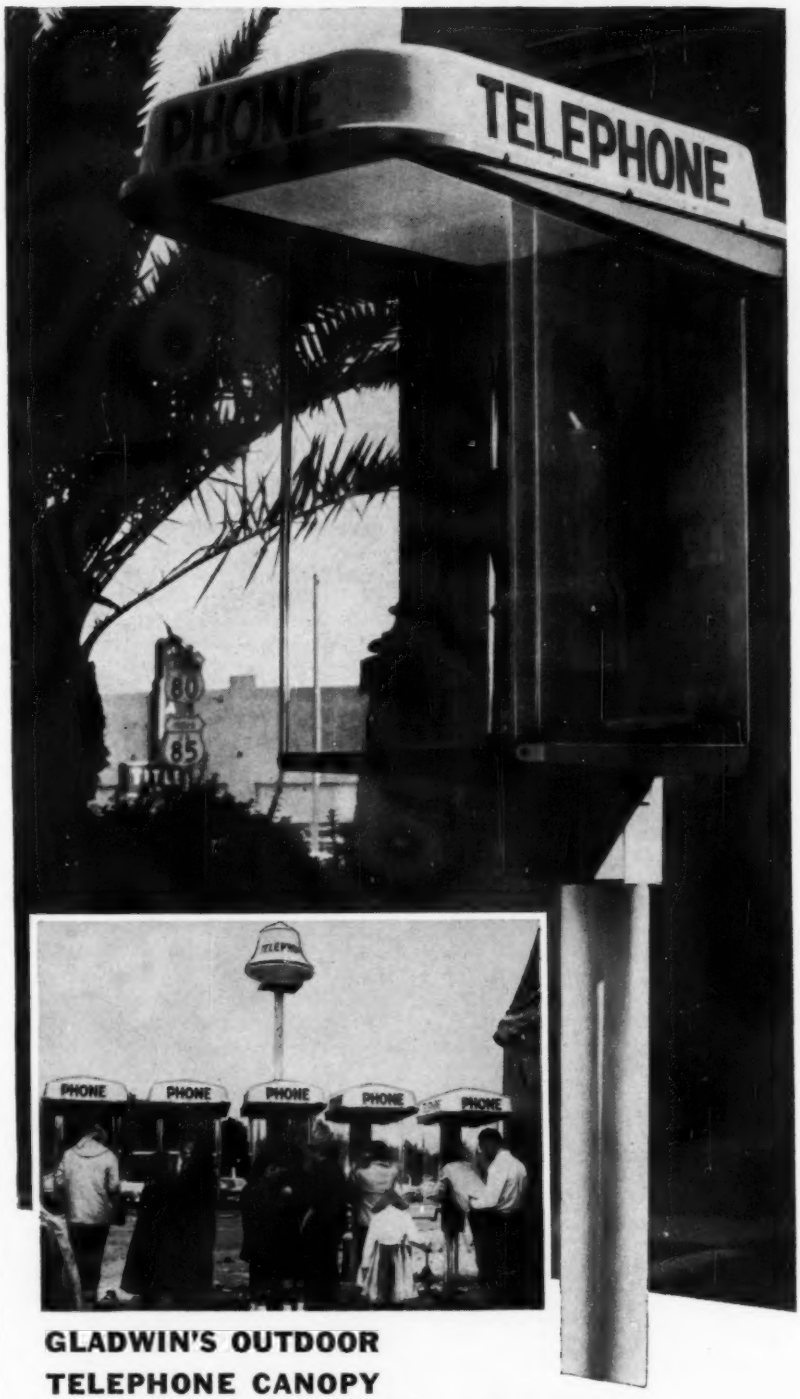
REA Bond Investments

The first REA bond sold to a co-op went to the Lee County Electric Cooperative, Fort Myers, Fla. This co-op purchased the first bond in a new 2 per cent Treasury series, available only to rural electric and telephone systems which borrow money from the REA. The co-op's order was for a $100,000 bond (TELEPHONY, July 16, p. 46).

The new government bond series, which was offered for sale by the Treasury on June 30, 1960, gives REA borrowers another place to put general funds not needed currently for operation of their systems. Bonds will mature in 12 years, but they may be redeemed at par at any time by the holder upon 30 days' notice. REA Administrator Hamil said that the bonds were developed in response to requests from a number of officers, directors, and managers of REA-financed systems.

Deadline for WU Cable Sale

Western Union has been warned that unless it submits a plan to divest itself of its international telegraph business by Sept. 1, it may be subject to "legal sanctions." The warning came from the FCC. Seventeen years ago, when Congress authorized Western Union to establish a monopoly in the domestic telegraph message field (by absorbing the old Postal Telegraph Co.), it was conditioned upon the understanding



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For state fairs, for conventions, for any location where traffic is heavy, the Canopy is your economical answer! Readily removable to other temporary or permanent locations!

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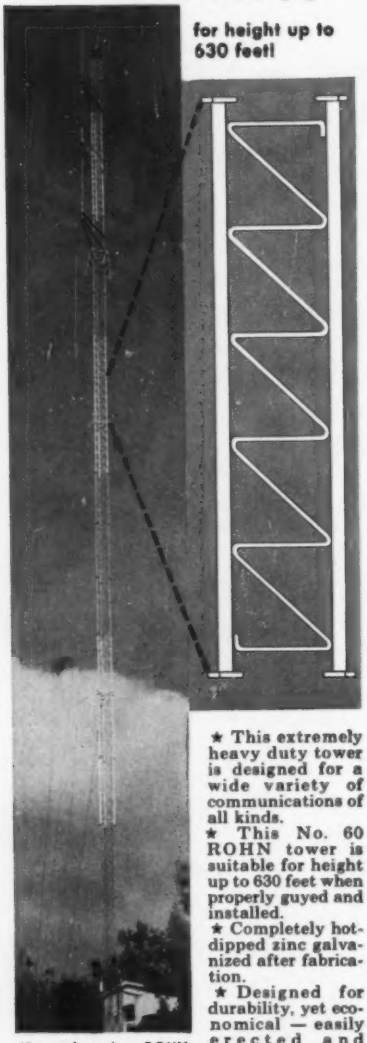
ROHN COMMUNICATION TOWER *No. 60*

for height up to 630 feet!



★ This extremely heavy duty tower is designed for a wide variety of communications of all kinds.
★ This No. 60 ROHN tower is suitable for height up to 630 feet when properly guyed and installed.
★ Completely hot-dipped zinc galvanized after fabrication.
★ Designed for durability, yet economical — easily erected and shipped. ROHN towers have excellent workmanship, construction and design. Each section is 10 feet in length.

Shown here is a ROHN No. 60 tower installed to a height of 200 feet with 3 five-foot side arms, mounting antenna for police radio communications.

FREE

Details and complete engineering specifications gladly sent on request. Also ROHN representatives are coast-to-coast to assist you.

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"Pioneer Manufacturers of Towers of All Kinds"

that Western Union would dispose of its overseas cable service.

The most recent of several proposals to do this was one submitted last February. At that time Western Union proposed to let Barnes Investment Corp. of Chicago take over the cable business for an estimated 13.5 million dollars. The Barnes company, however, sought additional time to arrange financing.

An extension was granted by the FCC until Aug. 2, with the provision that unless Barnes raises the needed money by then, Western Union must come up with another specific plan by Sept. 1. Just what "legal sanctions" the FCC may invoke, should Western Union fail to sell its cable holdings to Barnes, or not file a new plan to divest itself of its cable holdings by the deadline date, have not been indicated.

Telephone Lawyer Writes a Book on a Red Myth

If you are one of those ungallant persons who like to trap ladies of uncertain age by sudden questions about past events, don't try such obvious questions as "Did you ever see Calvin Coolidge?" or "Do you recall the day Lindbergh landed in Paris?" Any smart young (?) lady with her wits about her at all knows the proper way to squelch such impertinence. She will tell you, "I read about it in school," or "I saw a movie about it," or some similar clever *riposte*.

A sneakier question would be, "Do you personally remember the Sacco-Vanzetti case?" If the answer is yes, the lady is either a former child genius now past 40, or pretty well beyond the golden anniversary. Recently, however, there has been a revival of agitation in the press, on TV, and elsewhere, about this famous double murder trial of the two radicals following a double killing of a paymaster and his assistant at South Braintree, Mass., on Apr. 5, 1920. They were found guilty over a year later by a Dedham, Mass., jury. For over six years thereafter the case raged through four courts before 14 judges, including three justices of the U. S. Supreme Court. It was also reviewed in minute detail by the state governor and a special board of two college presidents and a judge. All verdicts were unanimous—guilty.

They were finally hanged Aug. 23, 1927. And the Reds of the world have been crying about them so much, ever since, that you need not be surprised if the bleeding hearts did not pass the hat to build a monument to their memory as heroes (instead of ruthless murderers).

All this has nothing to do with the telephone business, except that a very well-known former telephone company lawyer has added to the laurels of a distinguished legal career by writing a very absorbing recent best seller. It is called "*The Murder and the Myth*," by Robert H. Montgomery (Devin-Adair, New York City, price $5.00). Mr. Montgomery, a native of Oxford, O., and a graduate of North Dakota University (AB, '09) and Harvard Law School (LLB, '12 *cum laude*) was for a number of years general counsel for the New England Telephone & Telegraph Co., and, since 1944, a director of the New England Electric System.

This book meticulously and objectively reviews all the evidence in this famous case, and it makes you wonder how softheaded people can get so excited about such types (and you can throw in the late Caryl Chessman for this writer's money) as to cry over spurious Broadway shows and TV presentations. These characters were on trial for murder, not treason or subversive activity, although they were probably guilty of that too.

Montgomery points out that Sacco when arrested was carrying a 32-calibre pistol containing nine bullets (plus another 23 in his pocket) of such a rare type that neither the state nor the defense could duplicate them. They matched the slugs in one of the victims. Vanzetti was carrying a 38-calibre revolver, fully loaded. And he had four 12-gauge shotgun shells which connected him with an earlier unsuccessful payroll hold up. Both were positively identified by witnesses. Both had police records and were admitted draft dodgers. A voluntary fund of $300,000 was raised by various leftish groups for their defense. These were the parties Prof. Arthur M. Schlesinger Jr. of Harvard, has called "two obscure immigrants about whom nobody cared." (What the trial and appeals cost the taxpayers must have been in the order of a million.) Montgomery concludes that the defendants had a scrupulously fair trial, and few who read his book will think otherwise.

Perhaps, in these days of left-wing riots and agitation in Cuba and elsewhere to seize foreign-owned telephone and other utility properties, there *is* a connection between the people who make a career of building such myths and those who are giving the utilities a hard time today. This writer was especially interested in a facsimile reproduction on pages 72 and 73 of Montgomery's book of a 1921 letter sent out by the New England Civil Liberties Committee, passing the hat for contributions to the "defense fund." The letterhead contains 70 names, of which 25 subsequently became prominently

identified with radical socialist or outright communistic causes, including William Z. Foster and many of the Communist party top command. Perhaps the most incisive comment was expressed by the late U. S. Supreme Court Justice Oliver Wendell Holmes, when he called the Sacco-Vanzetti case an ordinary murder "turned into a text by the Reds."

Col. Cuphaver Reassigned to Signal Chief's D. C. Office

Colonel Carl A. Cuphaver, commanding officer of the Midwestern Regional Office of the U. S. Army Signal Supply Agency, Chicago, Ill., has been reassigned to the Office of the Chief Signal Officer, Pentagon, Washington, D. C., where, effective Aug. 1, he will assume duties as chief of procurement, Procurement & Distribution Division of that office.

Colonel Cuphaver returns to Washington after an absence of eight years, during which he attended the NATO Defense College, Paris, France; served as the Deputy Chief Signal Officer of NATO Headquarters, Allied Forces Northern Europe; and held various positions within the U. S. Army Signal Supply Agency before assuming command of its Midwestern Regional Office in Chicago.

Answers to Questions On Page 56

(1) Allow the customer to complete his request without interruption. If the name is one having different recognized or probable spellings, ask how the name is spelled. Give close attention to the request in order to avoid asking unnecessary questions. Start the search as soon as you believe you have sufficient details. Question the customer when the details are not understood, when additional details are required to start the search, or to verify the spelling.

(2) If something the subscriber has said is not understood, or if the information operator is uncertain of a detail, either ask again, or repeat, or spell it as you understood it in a questioning tone.

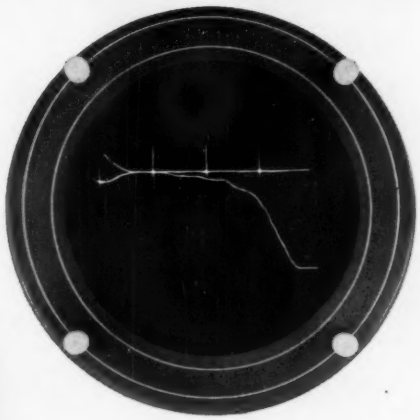
After a reasonable effort, if you still cannot understand the calling party, refer the case to the supervisor.

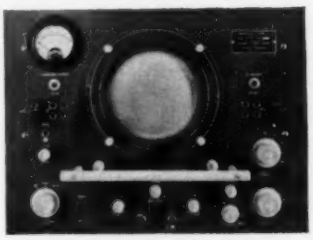
(3) There is no limitation.

(4) Yes.

(5) Search all prescribed spellings. If the customer is unable to give any form of spelling, look through the most common spelling or spellings, as long as this is within the limit of search.

*TRANSMISSION CHARACTERISTICS OF A 22H88 FACILITY AS DISPLAYED BY THE NEW HALLAMORE TMS-0100 SWEPT BAND TRANSMISSION MEASURING SET





*Typical Pattern: The horizontal trace is a reference line with frequency markers each 1000cps. Irregular line is the loss vs. frequency characteristic of a 22H88 facility, 54,000′ in length, showing losses of 8.0db at 1000cps, 8.5db at 2000cps, and 10.0db at 3000cps. Fast, precise transmission measurement and the availability of a permanent photographic record of readings are prime advantages of the Hallamore Swept Band Transmission Measuring Set. Designed and developed in the Hallamore Electronics laboratories, this unique instrument provides a continuous display of transmission characteristics, as illustrated. Range is from 200cps to 4000cps. Applications include measurements of repeater or amplifier gain; determination of return losses; and location of loading faults. This is a valuable everyday tool for the engineer or technician. For further information please write Hallamore Electronics Company, Telephone Department, 714 No. Brookhurst St., Anaheim, California. PR. 4-1010

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REVIEW OF NEW PRODUCTS AND TECHNIQUES

Concluded from page 30

mium-chromate plated and has holes spaced to fit all standard conduit boxes. The jack is made of high-impact styrene with spring tensioned jack holes for better conductance.

•

Connecting Blocks (Fig. 119). Three sizes of non-shorting covers are available to house one to four standard 10-terminal connecting blocks. These covers are furnished in brown, ivory or blue-beige. One of these blocks should be provided at each telephone location.

•

Face Plates (Fig. 120). Five different styles of face plates are available. Blank plates are usually installed by the contractor at all desired outlets except in cases where the telephone company specifies the style desired.

Outdoor Weatherproof Jack Assembly (Fig. 121). Demands for outdoor, backyard or patio telephone service is on the increase. This new non-rusting,

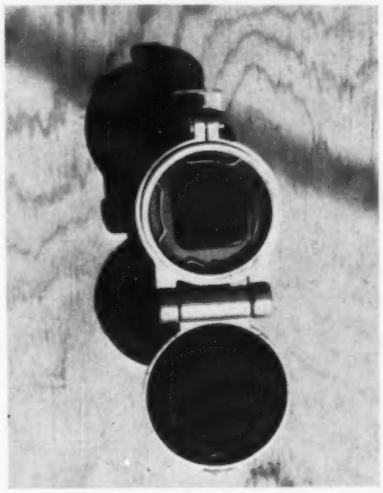

Fig. 121. Outdoor weatherproof jack assembly.

waterproof, aluminum receptacle that houses a conventional jack proves ideal for this purpose. This jack can be mounted quickly with screws in any location.

•

All-Purpose Indicator Lights (Fig. 122). This is a recessible, three-light unit, including face plate for flush mounting. It makes use of standard telephone switchboard lamps in 6, 12,

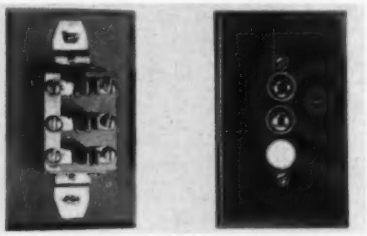

Fig. 122. All-purpose indicator lights.

24 or 48 volts. This device may be utilized to indicate trunk usage and to meet other signaling requirements.

•

Neon Flasher Lights (Fig. 123). These lights are designed for use in

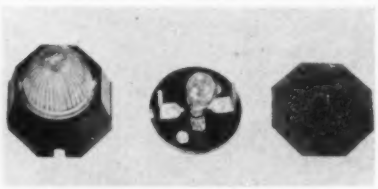

Fig. 123. Neon flasher lights.

offices, hospitals, factories, mills, residences, etc. They prove useful wherever a visual signal is required. May be furnished in white, ruby or green.

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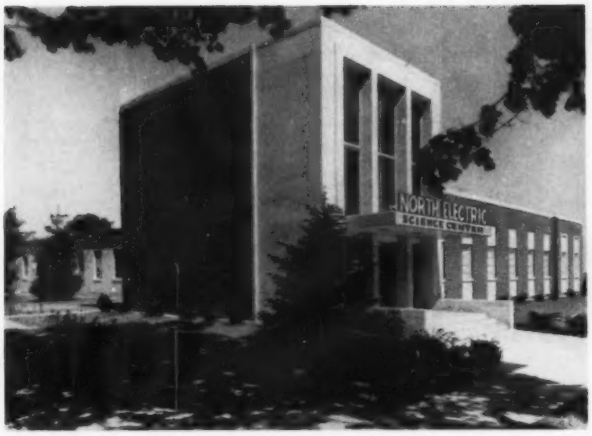

LEFT: North Electric Co.'s new Science Center where expanded research and development operations are proceeding apace. RIGHT: William Tucker, president of North Electric, shown back in February turning first shovelful of ground for foundation of North's Science Center. Standing behind Mr. Tucker's left shoulder is Gunnar Svala, director of research and head of the center.

Research in Full Swing at North's New Science Center

Expanded research and development operations are in full swing at North Electric's modern brick, steel and concrete Science Center near the company's main plant in Galion, O.

With the ground-breaking ceremonies on Feb. 27 and occupancy May 27, the Science Center may well have set a new record in industrial construction. The building has over 16,000 square feet under roof, and is designed to complement North's modern general office building, located across the street. The south and west walls of the Science Center are of concrete block curtain wall construction to allow for contemplated expansion.

The interior of the building is designed to incorporate a chemical and metallurgical lab, an electronic lab for circuit evaluation and analysis, a complete physical lab including reliability testing, a model shop and an up-to-date technical library. To man this facility, a campaign has been conducted in recent months to obtain additional engineering and scientific personnel who have gained recognition in electronic research and development.

The center's decor utilizes grained Marlite and steel paneling, translucent glass and modern painted walls and doors to create an impression of clean contemporary design. Individual staff offices are provided with immediate access to adjacent lab areas. Conference rooms are located throughout the building. The dramatic high-vaulted lobby features a symbolic mural covering the entire wall, illustrating North's present capabilities in development, design and production of communications and control systems, as well as related designs for Space Age communications. A modern atmospheric control system keeps the center's interior at a constant, comfortable temperature.

The center provides facilities for research and development of communications and control systems for commercial as well as many major military weapons systems. An electronic switching control center for the USAF 412-L project is currently receiving emphasis in the Science Center.

Special research and development teams are utilizing the facility to expedite solid state transposition of the company's current product line. Supervisory control systems, carrier and

reduce trouble reports

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Used for pressurizing aerial and underground telephone cables, the Model RC Dehydrator Automatic is designed for small installations of 80 to 100 miles of cable. It is a floor mounted unit. Operating voltage is 115/220 volts, 1 phase, 60 cycle, and the output is 700 standard cubic feet per day maximum, with a dewpoint of —70°F.

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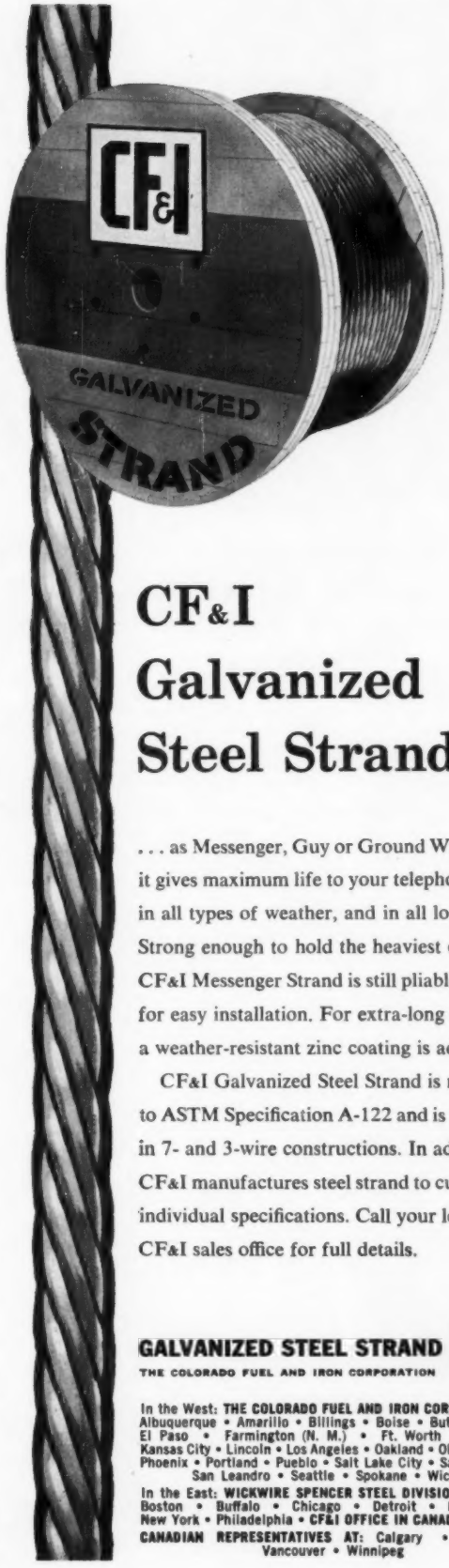

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. . . as Messenger, Guy or Ground Wire, it gives maximum life to your telephone lines, in all types of weather, and in all locations. Strong enough to hold the heaviest cable, CF&I Messenger Strand is still pliable enough for easy installation. For extra-long service, a weather-resistant zinc coating is added.

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The clutch case has side ports which afford easy "on-the-job" adjustment of clutch and brake. Power-operated integral winch and derrick allow easy pole-setting and lifting operations—up to 4,500 pounds.

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SALES AND SERVICE IN PRINCIPAL CITIES

power supply equipment are receiving immediate attention. Electronic switching designs under current investigation by military agencies have been placed under high design and engineering priorities in the new building.

Gunnar Svala, director of research and head of the new Science Center, reveals: "From this building will emanate a wealth of new ideas, designs and products based on solid-state electronic techniques for an expanding line of systems and devices for commercial, utility, industrial and military applications. Further expansion, both in personnel and floor space, will keep pace with the increasing world-wide demand for reliable, fail-safe communications and control equipment."

Midwest Telephone Supply to Serve Wis., Minn., N. Mich.

Midwest Telephone Supply, Inc., Appleton, Wis., has been formed to distribute a complete line of telephone equipment and related materials and tools to Independent telephone companies in Wisconsin, Minnesota and northern Michigan.

J. S. SPALDING

The company, incorporated in Wisconsin on Oct. 20, 1959, maintains offices at 136 N. State St., and a warehouse at 1510 Civic St., both in Appleton.

Midwest Telephone Supply began actively soliciting business in Wisconsin on Jan. 1, this year, and, as of May 1, in Minnesota. The company intends to service northern Michigan in the future.

President of the company is John S. Spalding. Associated with him in forming the company is Richard E. Lundgren.

Mr. Spalding has been construction field supervisor and purchasing agent for the Killoren Construction Co. for seven years, a post which he retains.

R. E. LUNDGREN

Mr. Spalding states that Midwest Telephone Supply is a separate entity and not owned by the Killoren company.

Mr. Lundgren for the last four years has been selling and servicing Independents in Minnesota, South Dakota and Wisconsin for Kellogg Switchboard & Supply Co. Prior to this activity, he worked in St. Paul for Westinghouse Electric Corp. on material handling and sales.

AE Labs Give Martin Award To Switching Head Kahn

Automatic Electric's highest honor, the Talbot G. Martin Award, has been presented to Frederick L. Kahn, director of the telephone switching systems development department of Automatic Electric Laboratories.

F. L. KAHN

The annual award was made by the Strowger Automatic employe clubs in recognition of Mr. Kahn's "outstanding

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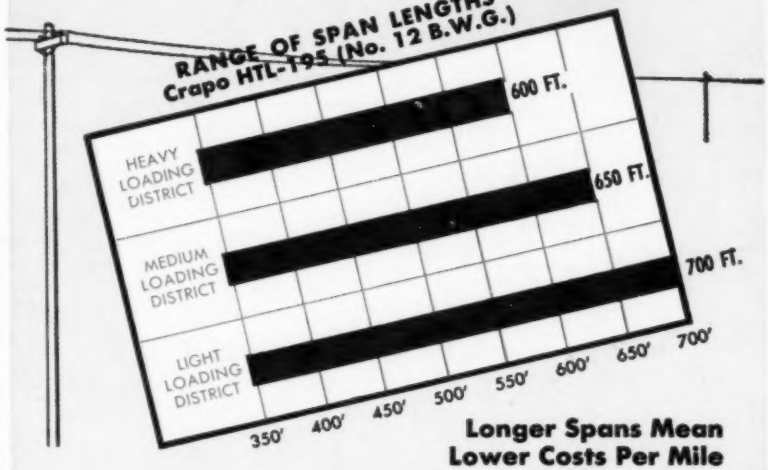
HTL-195

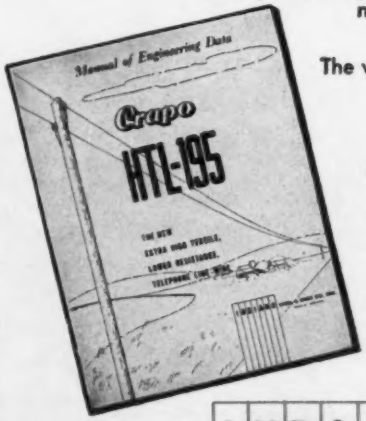
FOR EXTRA LONG SPAN RURAL LINES

The NEW LOWER Resistance Extra-High Tensile Line Wire



Longer Spans Mean Lower Costs Per Mile

You can cut the number of pole structures to a minimum when you use **Crapo** HTL-195 in building rural telephone lines. Extra long span construction, made possible by the high physical strength of this new wire, means marked savings in material and installation costs.



The voice transmission quality of **Crapo** HTL-195 is equal to that of **Crapo** HTL-135 and superior to older grades of ferrous wire.

Pertinent technical data have been prepared to assist engineers in designing and building extra long span lines with **Crapo** HTL-195.

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contribution to the art and science of communications."

A lifelong student of telephony, Mr. Kahn received his education at the University of Frankfort and the Institute of Technology in Berlin, Germany.

He began his association with the company in 1923 as an equipment engineer. Before promotion to his present position, he held supervisory positions in systems analysis, sales and equipment proposals, and cost studies. He was named systems consulting engineer in 1954.

He has become a specialist in all phases of automatic switching and has written articles on the subject for technical publications.

He has also traveled widely in consulting with telephone companies, and coordinating the technical activities of the company's foreign manufacturing plants in Canada, Belgium and Italy.

Mr. Kahn is a member of the American Institute of Electrical Engineers and holds six patents on telephone switching systems improvements.

General Cable Names Vincent, Higgins Managers

General Cable Corp. has announced the transfers of P. L. Vincent to regional telephone manager at Rochester, N. Y. from branch manager in El Paso, Tex.; and of E. L. Higgins to regional telephone manager at Minneapolis from resident salesman in Green Bay, Wis.

P. L. VINCENT

Mr. Vincent will manage telephone product sales in the Northeast states; Mr. Higgins will serve in the same capacity in the Dakotas, Minnesota, Wisconsin and Iowa.

Mr. Vincent has been with General Cable for seven years, first in outside sales and then in sales managerial responsibilities at New Orleans and El Paso. He has managed the El Paso sales office for three years.

E. L. HIGGINS

Mr. Higgins, also a seven-year man with General Cable, started with the corporation as an inside salesman in Milwaukee, the location of his alma mater, Marquette University. He was promoted to outside sales and has been resident salesman at Green Bay for four years.

GT&E International Names Two Vice Presidents

Col. Julian A. Dobrski and Carman R. Hughes have been elected vice presidents of General Telephone & Electronics International, Inc., newly-formed international manufacturing, marketing and engineering subsidiary of General Telephone & Electronics Corp. Announcement of the elections was made by Gene K. Beare, GT&E International president, on July 13.

In his new post, Colonel Dobrski is responsible for all manufacturing, sales, and engineering activities in Europe, North Africa, and the Middle East, involving subsidiaries and associated companies. His headquarters are at 40 Rue du Rhone, Geneva, Switzerland. Col. Dobrski will continue to serve as a vice president of Automatic Electric International, Inc.

A naturalized British citizen, Colonel Dobrski was born in Italy and educated in Italy, Spain, and France. From 1923 until 1940, he was associated with J. Bourdelier S.A., manufacturers of yarns and textiles with plants in France and affiliates throughout Europe. Colonel Dobrski was president of the Bourdelier company at the start of World War II.

During the war, he served with the British Army in the Mediterranean area. Twice wounded, he was decorated with the Military Cross, the Order of the British Empire, and as a Commander of the Order of St. George.

In 1946, Colonel Dobrski rejoined J. Bourdelier S.A. as president, but resigned in 1949 to become a vice president of Automatic Electric International.

Mr. Hughes, in his new post, is responsible for coordinating all manufacturing, sales, and engineering activities in Canada, involving subsidiaries and associated companies. In addition to serving as a vice president of GT&E International, he will continue to serve as president of Automatic Electric (Canada) Ltd., Automatic Electric Sales (Canada) Ltd., and Canadian (B. C.) Telephones & Supplies Ltd. His headquarters are at 100 Strowger Boulevard, Brockville, Ont., Canada.

A citizen of Canada, Mr. Hughes was born in Oshawa, Ont. He was graduated from that city's Collegiate College and Vocational Institute, and subsequently attended the Radio College of Canada.

Following service with Northern Electric Co. in Canada, Mr. Hughes joined Automatic Electric Sales (Canada) Ltd. in Toronto in 1941, and was appointed manager of the telephone sales division in 1950.

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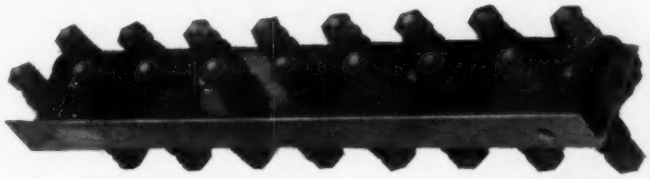
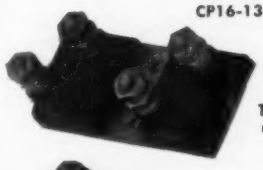


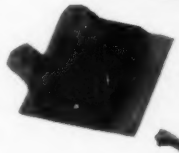
SIXTEEN PAIR
CP16-136

TWELVE PAIR
CP16-135

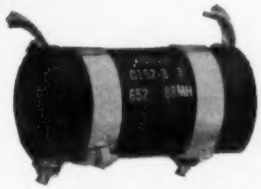
SIX PAIR
CP16-134



TWO PAIR
CP16-133



ONE PAIR
CP16-137



C152-3
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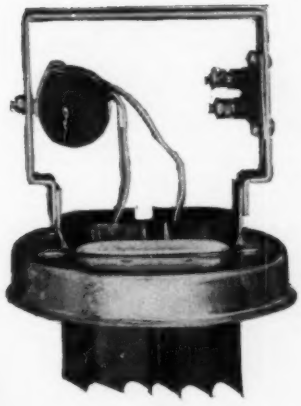
ASSEMBLY



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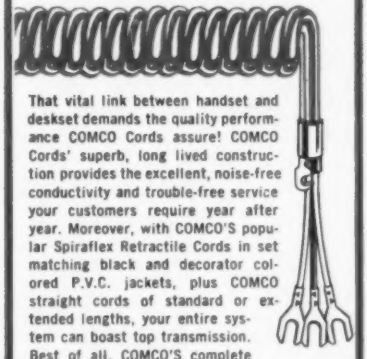

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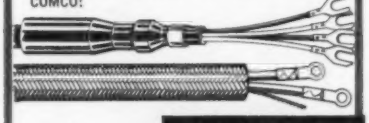

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AUTOMATIC ELECTRIC SALES CORP. Northlake, Ill.

He was elected vice president of that company in 1953, and later the same year was elected president of the organization as well as president of its manufacturing affiliate, Automatic Electric (Canada) Ltd. He was elected to the additional post of President of Canadian (B.C.) Telephones & Supplies Ltd. in January, 1959.

During World War II, Mr. Hughes served in the R.C.A.F. as a flight lieutenant.

Graybar Electric Appoints 1 Pa. Manager, 2 in Tex.

Graybar Electric Co., Inc., has announced three managerial appointments, effective July 1.

A. W. Hallett became Graybar manager at Allentown, Pa., replacing A. Stang Jr., who was transferred to the Long Island City, N. Y., branch office.

B. G. Draper was appointed operating manager for Graybar at Corpus Christi, Tex.; and F. G. Murray was named manager at San Antonio, Tex., succeeding R. N. Ness, who assumes special duties in Dallas.

Communications, Computing Center Planned by Collins

Plans for the construction of a two-story communication and data processing center in Cedar Rapids, Ia., have been announced by Collins Radio Co. The proposed building, covering some 38,000 square feet, is expected to cost about $750,000 exclusive of operational equipment and furnishings.

When completed, the center will house a fully operational system of Collins single sideband and microwave communication equipment and a centralized computing system. Ground was broken for the new building on July 7. The center is expected to be in the first phase of operational use by Mar. 1, 1961.

The centralized computing system will be used directly by all of the divisions of Collins throughout the United States and Canada. When the computing section is fully operational, information will be sent into a giant IBM 7070 Computer by an extensive company data link system called Kineplex, which Collins reports is an exclusive electronic data processing system developed by their Western Division.

Collins divisions, the company says, will be able to have their inventory, shipping, receiving, production and payroll records and other information necessary for daily operations sent by wire into the central computing system, and the data will be fed back to the individual branches from the Cedar Rapids center.

The new communication and data processing center also will house the company's central communication switching facilities and will afford more efficient use of Collins inter-plant network of teleprinter and telephone lines.

T. A. Moore Named Sales Head for Taylor-Colquitt

Thomas A. Moore has been appointed sales manager of the Taylor-Colquitt Co., it has been announced by A. Brandon Taylor Jr., president. Effective June 1, Mr. Moore succeeded M. P. Brown who resigned.

Mr. Moore is a native of South Carolina, having been reared in Moore and Spartanburg. He attended Spartanburg city schools and Baylor Military Academy, Chattanooga, Tenn.

T. A. MOORE

He was graduated from the University of South Carolina with a B.S. in business administration in 1938.

In 1941 he joined Taylor-Colquitt Co., serving as purchasing agent-supplies.

During the war, Mr. Moore served as a naval officer in the Pacific area. Following the war, he rejoined the company and was transferred to the sales department, traveling in North and South Carolina and east Tennessee.

In October 1959 he was named district sales manager and served in that capacity until his present appointment.

Holan Corp. Names Canfield Manager at York, Pa.

Charles S. Canfield Jr. has joined the Holan Corp. as district manager in York, Pa.

Mr. Canfield will direct Holan sales activities in parts of Delaware, Maryland, New Jersey, Pennsylvania and in the District of Columbia.

He was a sales engineer for the body

C. S. CANFIELD JR.

division of the York-Hoover Corp. before joining Holan. Prior to that, he was senior metallurgical laboratory technician for the Caterpillar Tractor Co. at York, Pa.

Holan, manufacturer of utility truck bodies and truck-mounted power equipment for use in the communications, electric power, and other industries, has plants in Cleveland, Phoenix, Ariz., and Griffin, Ga.

L. J. Gaddis Closes Career With Automatic Electric

Leslie J. Gaddis, staff sales engineer, has closed a long career with Automatic Electric Sales, after half a century of service with the subsidiary of General Telephone & Electronics Corp.

Mr. Gaddis began as an office boy. After completing his high school education at night, he took a four-year course at Lewis Institute to further his training in electrical engineering.

In 1916, following a series of shop assignments, Mr. Gaddis became an installer. He became a staff engineer in 1926 and later served as sales manager for the western and central districts. He returned to the Chicago office in 1945 as a staff sales engineer. Highlights of his record include selling the first automatic toll ticketing installations in the states of Louisiana, Nebraska, Illinois, and Wisconsin.

In addition to his achievements in sales, Mr. Gaddis has been honored for his ideas. He wears a diamond-studded ring, resembling a telephone dial, which was presented to him in 1925 for his helpful suggestions.

L. J. GADDIS

Although he traveled about 65,000 miles a year, he still had time to become a registered professional engineer of Illinois, and a member of the Independent Telephone Pioneer Association. Also, when AE won the Chicago Industrial Baseball League championship during the 1921-23 seasons, L. J. Gaddis was one of the team's strongest pitchers.

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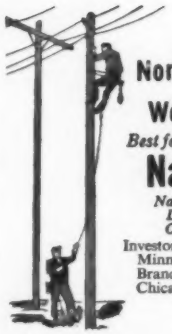

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21 Pair, #19 Ga., As Above	2,100 Ft.
26 Pair, #19 Ga., As Above (800 & 500 Ft. Lengths)	14,000 Ft.
51 Pair, #19 Ga., As Above	2,000 Ft.

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7 Quad. #19 Ga., Paper Lead	100 M Ft.
7 Quad. #19 Ga., Plastic, PVC	5,300 Ft.
37 Quad. #19 Ga., Paper Lead	1,050 Ft.
51 Pair #19 Ga., Paper Lead (plus 4 #16 Shielded Pair with polyeth, insulation) video.	1,200 Ft.
303 Pair, #22 Ga. Ankoseal 775P	2,300 Ft.
5 Pair, #19 Neoprene (Latex Ins.)	50 M Ft.

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#18 Ga., Copperweld, Neoprene, Reinforced Parallel, Lengths Average 500 Ft. (Used) ..... $10 M

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DRAINAGE COILS, #257A Retard, W.E. 5.00
2 Coils on 19" Mtg. with Protectors 10.00
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3/4"x12"	.50
Lift Plates, 3 Hole, 5/8"	.15
Guy Attachments, Chance 158, 5/8" (Similar to Jos. 6500, Hubb. 1100)	.35
Guy Attachments, Strap Type 1 Hole	.15
2 Hole	.20
Clamps, Ground Rod, Cast Bronze 1/2" (Sq. Head Set Screw) 200 for	25.00
Machine Bolts, 5/8"x12"	.20
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1/2"x22"	.25
Lay-Cit Grips (for Self-Supp. Cable)	.15
Bridging Connectors, W.E. #2A	.05
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#17-2	2.00
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Less Exploring Coil 39.50

TRANSMISSION MEASURING SETS

W. E. 13A, Reconditioned	$100.00
32A, (Carrier)	100.00
19C, Oscillator	150.00
51A, Oscillator	100.00
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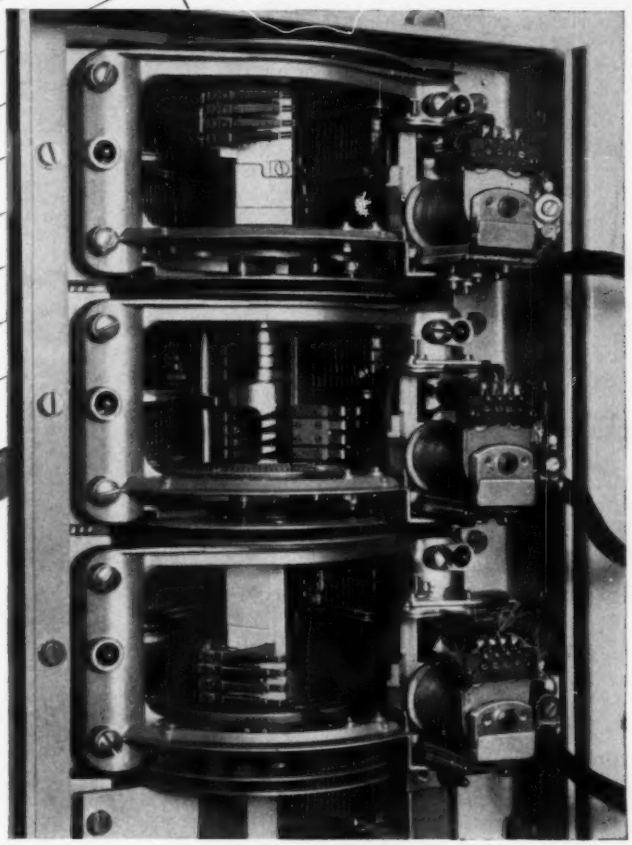

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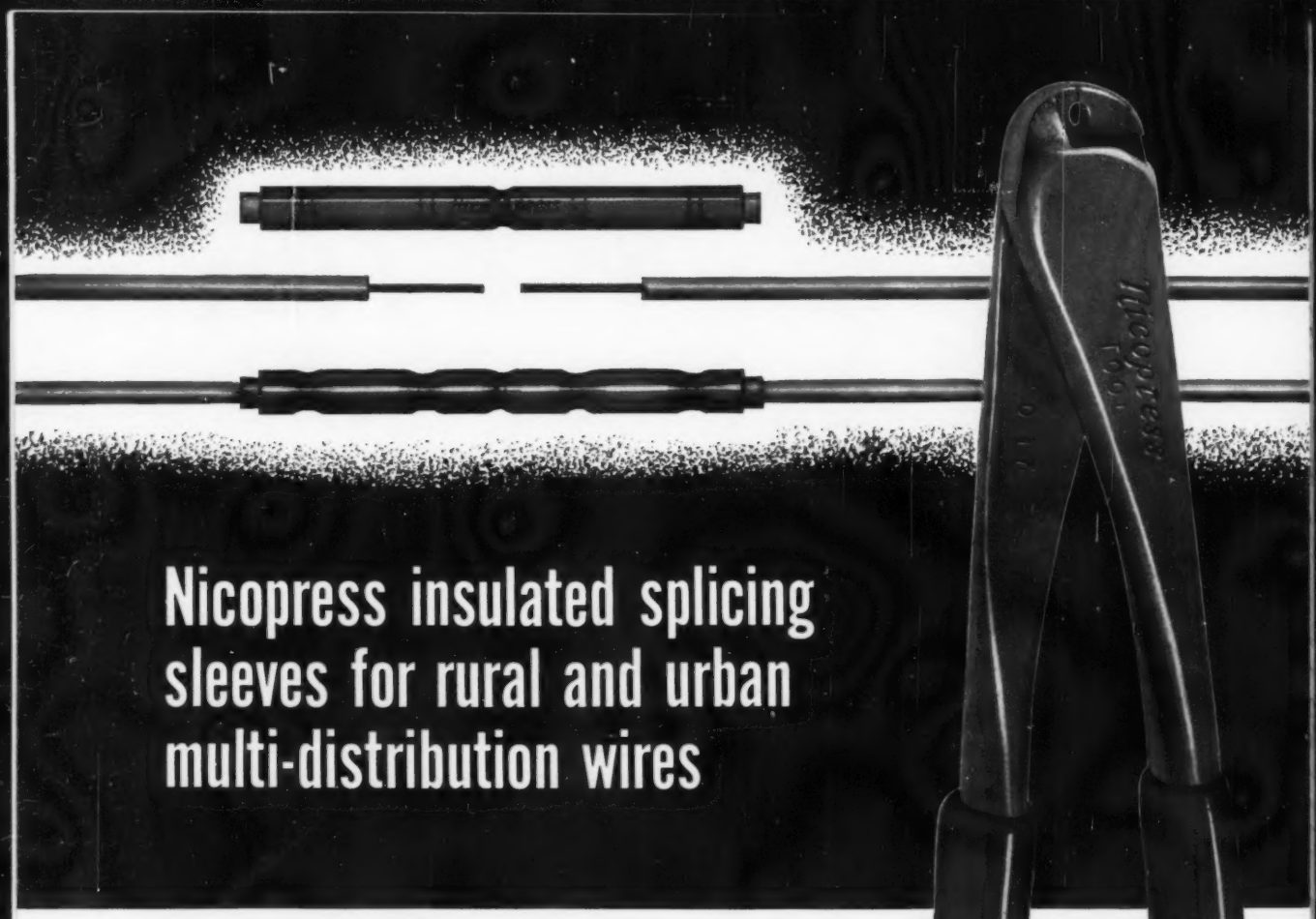

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